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FOOD MANUFACTURE

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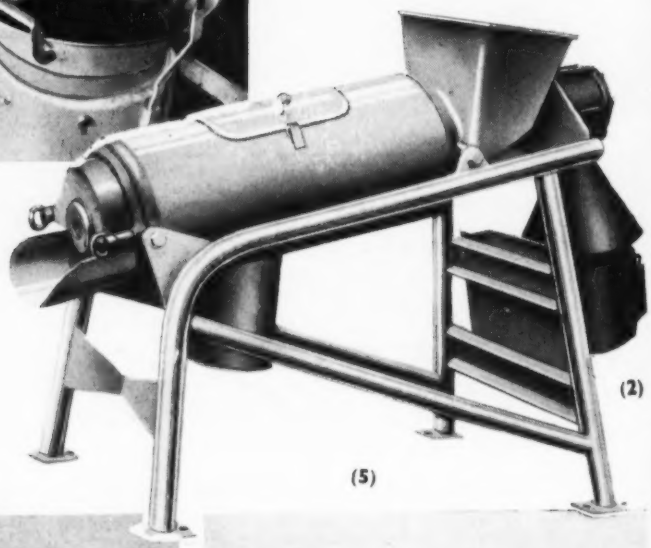

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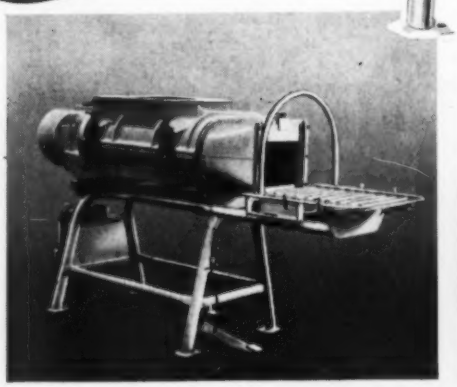

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FOOD MANUFACTURE

Vol. XXVI, No. 8 August 1, 1951

Weights and Measures

ELSEWHERE in this issue are summarised the main recommendations about food in the recent Report of the Committee on Weights and Measures Legislation. There are, however, other and more general proposals in the Report that deserve separate comment. There is, for example, the suggestion that we should face up to the illogicalities of our Imperial weights and measures system and discard it in favour of the simpler metric system.

Will John Bull ever discard something he has long called "Imperial" and take up something "Continental" in its place? The Committee thinks that it could be done in a period of twenty years without great dislocation. We are inclined to think that the Committee is underestimating public resistance to changes having regard to present-day conditions. If the value of the £ is vague, the man in the street still knows what a sixteen-ounce pound is, and how long a yard is. He can hold some sort of economic balance, albeit a dwindling one, in an age of falling monetary values.

If all the units of measurement were changed (for that, virtually, is what conversion to the metric system would mean), public suspicion would be immediately and widely aroused. From most points of view the metric system has always been far better than our cumbersome hotch-potch of weights and measures, but there could hardly be a more dangerous time than now to attempt to make the change.

One other proposal in the Report is that trading Government Departments should not continue to be outside weights and measures law. For example, the postmaster's weights may or may not be accurate, but woe betide the grocer next door or the barrow boy in the gutter outside if their weighings deviate one jot or tittle from the truth.

The Committee might well have pressed more vigorously for an end to this form of "Divine Right." It is surely not enough to appeal for a voluntary conformity by trading Government Departments. The argument that there are constitutional reasons making it impossible for Government transactions to come within the full scope of weights and measures legislation will not be accepted by everyone as readily as it has been by the Committee.

Muscle and Meat

A brief review of existing knowledge and an indication of future possibilities in research on muscle and lean meat are given in a recent article by Dr. E. C. Bate-Smith, Superintendent of the Low Temperature Research Station, D.S.I.R. (*Food Science Abstracts*, **23**, 3).

Perhaps the most important outcome of the study of muscle will be the knowledge gained of the way in which living cells convert chemical energy into mechanical energy. The efficiency of this process is higher than in any man-made machine and knowledge of its secret may be of immense value to the human race. We may be very close to the answer at the present time.

Describing the work being done on the physiology of *rigor mortis*, the physiology of dying muscle, Dr. Bate-Smith points out two facts which have been firmly established. Firstly, the stiffening which takes place during *rigor mortis* is always associated with the disappearance of adenosine triphosphate, which seems to be the immediate source of energy for many of the processes. Secondly, the shortening of the muscle during *rigor mortis* is determined by the rate of disappearance of adenosine triphosphate.

Muscle in the laboratory is lean meat in the larder. The stiffening and shortening of muscle, together with the production of lactic acid, influence the ability of the meat to "drip." Drip is much increased by freezing and thawing, and a good deal of effort is being directed to the correction of this defect. Control of drip can be looked for by modifying either the physiological process of *rigor mortis* or the physical process of freezing and thawing.

While low acidity is favourable for reducing drip and therefore for frozen meat, high acidity inhibits the growth of bacteria that spoil meat and is therefore desirable for keeping meat fresh. Lactic acid affects the quality of meat in other ways—as a component of meat taste and flavour, in its effect on the cooking of meat, and in the processing of canned meat. By suitable feeding of the animals and avoiding heavy exercise shortly before slaughter, it is relatively easy to reach a favourable high acidity.

The next stage of investigation will be to explore equally simple means of modifying *post mortem* behaviour in any other desired direction.

Rice from British Guiana?

British colonies in South America have never attracted as much attention as those in Africa or Asia; yet British Guiana has an important position on the north-east coast of South America, occupies 90,000 square miles, and is now, because of the elimination of malaria, far riper for development than ever before. As a mainland base for the West Indies, capable of feeding and perhaps eventually of absorbing the surplus populations of those islands, British Guiana's development should not be long delayed.

As the West Indies already face enough problems over sugar production and its disposal, the crop that is the key to progress in British Guiana is rice; not peasant-farmed rice but large scale mechanised rice growing on the fertile coastlands, where great areas of land have ceased to be cultivated because of depression or lack of water control.

The first experimental scheme for mechanised rice production, run by the Government, has been outstandingly successful. How long it will take before this long neglected colony becomes an important rice centre now depends mainly upon the annual rate at which public or private finance is made available.

Algae for Food?

Many new methods of food processing, such as the production of yeast protein from waste carbohydrate, have ceased to be mere speculations and are already in operation. One that still belongs to the future is the use of pond algae. Normal agricultural plants, virtually the basis of all food, are no more than agents for capturing the energy of the sun, the carbon dioxide of the air, and the minerals of the earth. The far simpler plants, known as algae, are no different although they seem less palatable and sizeable. To utilise algae for food production, it is first necessary to remove them from the pond and put them where their growth and multiplication rate can be greatly increased.

Dr. J. E. Meyers, Director of the University of Texas Algal Laboratory, has now shown that this can be successfully achieved. His process involves the use of two narrow glass tubes, one inside the other; in the narrow space between the tubes he grows *chlorella* algae in water. Carbon dioxide is bubbled through the water and dissolved minerals are supplied. For each gallon of water, Dr. Meyers grows half a pound of algae; in a pond as much as 50,000 gallons would be required to produce this rate of growth. The problem has largely been the creation of satisfactory growing conditions for high concentrations of the algae plants in thin layers of water; in the pond, the algae form a surface layer or scum on the top of a large volume of water.

If this small experimental apparatus can be transformed into a factory scale plant, the next phase will be to convert the "crop" into food. It is believed that algae will at least provide animal food and may be used in the production of oils or fats.

In comparing this process with the hydroponic or soilless cultivation of normal food crops, which has not proved economic (except in abnormal circumstances), the feeling is that the same disadvantage will apply to algae "factories," but there is a considerable difference. Food crop plants require space, whereas algae are minute plant organisms that can be grown, much as micro-organisms, in series of thin layers of the growth medium. Production on a commercial scale is feasible; this has never been the case with hydroponic crops which require nearly as much space as crops grown in soil.

U.S. Training in Food Technology

In a few months a new million dollar building will be completed at the University of California's College of Agriculture. It will be fitted with pilot plant to carry out almost every process now used in the food industry—dehydration, canning, pickling, evaporation, freezing, cold storage, and packaging. A range of cold storage and incubating rooms will enable long and short testing for the deterioration of fresh or processed foods under diverse conditions. Stores with variable and controlled humidities will also be available. Food tasting will have its own section, with air-conditioned and odour-removing facilities.

All this may sound like the prospectus of an ideal food research station, the working Utopia for many a food industry scientist. This is not, however, the main purpose of the building. It is intended principally as an educational centre for food technology students, a "pilot wing" of the University in which they can be taught food handling and food processing under semi-commercial conditions, and where they can learn how to test new products or packs by appropriate "applied research" methods.

Naval Food Supplies

At a recent meeting in Washington of the Food and Container Institute, some new research into diets of submarine crews was reported. The major result is that a better diet, requiring 25 per cent. less storage space and 65 per cent. less garbage disposal, has been devised. Under war conditions the problem of garbage disposal is highly important, for food waste rising to the surface may give a clue to the position of the submarine.

The main contribution towards this better and space saving diet was made by frozen and precooked foods. These included not only meats, fruit, and vegetables, but also ready mixed bread and cake ingredients. The latter brought a much needed ad-

dition to submarine diet, which was said to be too low in its content of pastries, cakes, rolls, and bread.

An interesting finding during the three months' experimental cruise was that, as it lengthened, the men demanded more and more highly spiced food, such demands being considerably in excess of standards of feeding on shore, even assuming a natural taste for spiced meals. One of the experimental frozen and precooked meals, a spiced chicken dish, scored a psychological success that far outweighed its intended nutritional contribution to the diet.

It is understood that these results will be applied not only to the planning of U.S. submarine diet but also throughout the Navy.

Engineering advances that have enabled submarines and large ships to stay at sea much longer have brought many new feeding problems in their wake; such factors as storage space as well as nutritional requirements must receive major consideration. The solution of these problems must finally rest upon the shoulders of the food industry.

Antibiotics and Nutrition

The remarkable results obtained in America in connexion with the use of such antibiotics as penicillin and terramycin as trace additions to animal feedingstuffs were briefly discussed here a few months ago (FOOD MANUFACTURE, **26**, 2, 47). At a recent meeting of the Society of Chemical Industry's Food Group, Dr. W. F. J. Cuthbertson's paper on this subject, and particularly the discussion that followed it, revealed that British reaction and opinion are exceedingly cautious.

The management and feeding practices of our stock farmers are very different from those of the United States. Moreover, it had already been found that pigs reared under fully hygienic conditions did not respond to antibiotic additions to their diet and this suggested that the role of these substances was the suppression of growth-inhibiting pathogens or other organisms present in the cattle in sub-clinical quantities.

If this theory is correct, there will be a serious long-term danger in developing antibiotic additions to feedingstuffs as a standard practice, for this in time might lead to the development of resistant strains of bacteria far more growth-inhibiting than those that apparently now succumb to the penicillin family. Neither is it yet known whether useful organisms are not also killed by these powerful substances. Short-term results often produce evidence of success, but unpredictable phenomena are sometimes revealed in long-term reactions.

British experts are clearly following Asquith's famous dictum "Wait and see," and are fairly content that the United States scientists and farmers should do the seeing.

Front-line Beverage

As a result of experience in Korea, the U.S. Army Medical Corps are interested in the production of a new hot drink. In the immediate treatment of wounded men, front-line stations rely upon cocoa, tea, or coffee for restoring the nutritional balance and minimising shock, but it is felt that some better and easily prepared hot drink could be developed by the food industry.

Lt.-Col. Carl Koehn, chief of the Surgeon General's nutrition branch, has listed the properties that such a beverage should possess. They are as follows: it should have a high protein content and a high calorific value; it should be in dry, powder form with a 60 per cent. milk powder basis; it should be easily preparable under front-line conditions; the powder must be capable of ready reconstitution with water and stay mixed so that it can, if necessary, be fed nasally; it must have an attractive taste or wounded men might not drink it though it would be much more restorative than hot drinks to which they were traditionally accustomed.

This does not seem to be a problem beyond the capacity of the modern food chemist, nor one that would take long to solve. Moreover, such a product would probably find domestic acceptance in the food market.

The Tinless Can

After years of research into the perfecting of a process for making a virtually tinless container, the American Can Company recently passed on details to the industry during a formal demonstration of techniques for making an enamelled steel container. The only tin used was 3 per cent. in the thin strip of solder which seals the side seam of the can. Solder in general use before 1939 was made up of about 40 per cent. tin and 60 per cent. lead. Within the last year, the tin content of such solder has averaged less than 8 per cent.

Describing the new process, Dr. B. S. Clark, chief of Canco's research laboratories, said that it employed an organic coating of domestic manufacture for protecting the steel base and the contents packed in the can. The process makes possible a saving of more than 92 per cent. of the tin normally used in the manufacture of several large volume sizes of cans.

The principal difficulty in making cans of steel sheet with no tin coating has been in soldering the side seam of the can, and, until recently, progress in soldering uncoated steel has been slow. The "tinless" can has now been made in pilot-line operations at speeds comparable to those at which tinplate cans are made. The enamel used to coat the inside of the cans, while still not suitable for highly perishable foods, is greatly superior to chemicals used to

surface "black-plate" cans during World War II, according to Canco officials.

An enamel that enables every kind of product to be placed in the can has yet to be discovered. One research group is attacking this problem, and is working on a new type of enamel that withstands corrosion encountered with highly acid products such as tomatoes and citrus juices. The company is working with resin manufacturers to produce a tin-free "universal" cement, to be used on cans containing all types of foods.

Two of the new cements have been placed on factory trial, and four others are in process of development. One of these is designed to replace solder used on heat-sterilised cans; if it is successful, it will solve a major problem encountered in producing a non-metal solder.

Some cans using the tin-free cement are already being tested by several packers of oil and anti-freeze products.

The comparative cost of the two types of solder depends on the price of tin. Ordinarily, however, there is no appreciable difference in manufacturing cost, the advantage of the non-tin cement lying in the abundance and availability of its ingredients.

Praise for U.S. Food Research

The visit to the U.S. by a number of our grocery specialists, led by Mr. F. Monkhouse, has been described by him, in a message from Washington, as "very instructive and rewarding." He told interviewers in that city that the experience of watching how the United States produces and packages its foods will aid the British dry grocery industry in streamlining and perfecting some of its operations.

A crowded itinerary took them to see some of the most important food processing plants in the United States, including the National Biscuit Company, Pillsbury Mills, the Quaker Oats Company, the Kraft Foods Company, the American Sugar Refining Company, and the General Foods Corporation.

Mr. Monkhouse spoke enthusiastically about the opportunities "to learn all they can teach us" which have been given by Americans in the grocery business. When mentioning American food research laboratories, he said "they have been an eye-opener to us—so large, well equipped, even luxurious, you might say."

Research being carried out in connexion with the utilisation of waste products in food processing was of particular interest, as was the work being done in the field of "chemurgy," which is enabling those parts of crops that used to be completely wasted to be converted into a variety of useful products.

"When we get home we will disperse to all parts of our land to tell of our experience here," said Mr. Monkhouse. "One thing certainly stands out in our minds and that is the wider variety of foods in America, and the efficient manner of processing and merchandising."

Doubtless those concerned in Great Britain with the products studied will look forward to an early report of the findings of the team.

Linoleic Acid Synthesised

Linoleic acid, one of a group of fatty acids known to be essential in the diet of test animals and presumably required by man, has been made synthetically at the Atomic Energy Project of the University of California's Medical School in Los Angeles, it was announced at the 118th national meeting of the American Chemical Society.

The new method of synthesis serves to establish the details of the structure of linoleic acid and will make possible further research to determine the vital role of this compound in the life processes of animals, according to a report by Dr. David R. Howton, Dr. Harry M. Walborsky, and Robert K. Davis. For instance, linoleic acid containing radioactive isotopes of carbon can be synthesised so that the acid's function may be determined, and its course through body metabolism may be followed, by means of tracer techniques.

Linoleic acid is an important ingredient in the drying oils used in paints, but since it is easily obtained in large amounts from sources such as flax and sunflower seeds, the new laboratory synthesis does not constitute a threat to the long established and extensive agricultural interests supplying the needs of the paint industry.

According to the report, the successful synthesis of linoleic acid has supplied new knowledge of the structure of this important dietary factor and may stimulate research aimed at discovering more effective and possibly simpler substances which will result in the same physiological benefits when added to the diet.

Supplementing diets with small quantities of such substances may be particularly urgent in countries where serious fat shortages exist.

FUTURE ARTICLES

THE September issue of FOOD MANUFACTURE will be particularly concerned with factory lighting and equipment. An article on "Lighting in Canneries" will give the results of surveys conducted in numerous food canning factories by a Sub-Committee on Lighting in the Canning Industry appointed by the Illuminating Engineering Society of the U.S.A.

In addition, there will be an article on floor surfacings for food processing plants, and a symposium of developments in the field of lighting and other equipment for factories.

Sausage and Cooked Meat Production

The House of Wall was founded in 1786 by Richard Wall in St. James's Market. In 1834, Thomas Wall moved to Jermyn Street, where he opened a pork butcher's shop which is still in existence. Various royal appointments have been held throughout the long life of the company including those to George IV, William IV, and Queen Victoria. The growth of the company since those early days has been rapid; today its products are manufactured in large factories throughout the country—ice cream at Acton, Godley, and Edinburgh, and sausages and meat products at Willesden and Godley.

BETWEEN the years 1935 and 1936, it became apparent that the company's ice cream industry at The Friary, Acton, was expanding at such a rate that the accommodation there was not sufficient to cope with both ice cream manufacture and the production of sausages and other meat commodities.

Plans were therefore made to move the meat department from Acton to Willesden, where the company had already erected a bacon factory and slaughterhouse. It was therefore logical that the meat products section should move to this new location.

Prior to the war, work was started on the erection of the new factory, but the outbreak of hostilities made completion of the project impossible owing to the difficulties of obtaining delivery of the requisite plant and machinery. It was therefore decided that, for the duration of the war, the Willesden factory should be used mainly as a store.

Transfer of Operations

At the end of the war, planning and the installation of new plant were proceeded with. By October, 1949, the transfer of the first department was well under way. Section by section the new factory began to take shape and to get into working order. The work of moving was carried out at weekends, production being carried out partly at Acton and partly at Willesden, so that throughout the whole of the moving operations no production was lost.

By the end of 1950 the complete transfer had been effected; although the factory is now in full operation, it will take at least another year before everything is absolutely shipshape and running in accordance with the high standards demanded by the company.

The large and well-planned building consists of basement, ground floor, with four storeys above. With the exception of half the first floor, where the factory and distribution accounts and sales departments are housed, the whole of the factory space is devoted to production.

Three Production Departments

The factory is split up into three production departments: fresh sausage manufacture, the bakery, and the cooked meats and canning department. In addition, there are two further sections in which the meat is prepared for use in the various production departments.

Fresh pork and beef sausages are the chief products made by the company, who also carry a large trade in all types of pies ranging from 1 lb. to 6 lb., as well as many of the smaller varieties weighing from 4 oz. to 5 oz.

In the cooked meats and canning department, luncheon sausage, liver sausage, black puddings, pressed meats, brawns, and galantines are produced. The majority of such items as canned sausages, tongues, Irish stew, and steak and kidney puddings are packed for export, a considerable proportion of the canned sausage

Flour is measured out for dough making.

Trays of small pies are loaded into an oven.

The jelly for use in pie manufacture is tested for strength.

Before placing in the cold stores, pies are injected with jelly.

output being packed at the moment under contract to the War Office. This particular commodity was also made under a similar contract during the war when the company produced some 48 million A 2½ cans of sausages for the troops.

Preparation of the Meat

On the first floor of the factory an array of butchers bone out the meat required throughout the manufacturing departments. Beef for sausages is sent down to the ground floor, where it is ground and weighed according to the recipe, as required.

Trimmed meat is fed into trays, and also at this point the requisite amount of fat, cereal filler, and seasonings are weighed out. These ingredients are then loaded in different trays on to a 750 ft. long overhead conveyor, which takes these trays up to the second floor where the manufacturing of sausages is carried out.

The pork, which is boned on the first floor, is loaded on to this same conveyor as it passes through the first floor and in turn is taken up to the next floor for the manufacture of pork sausages.

On the first floor is also stationed a machine which strips the rind from pork fat, the rind being used in the manufacture of jelly which is later injected into the pies.

When the trays of meat and other ingredients reach the second floor, the preselector on the conveyor enables them to be set down at any given point along the battery of bowl choppers. After emptying, the trays are replaced on the conveyor which takes them back to the ground floor, *via* a washing machine, for further consignments of ingredients.

Sausage Manufacture

Operatives in the sausage making department feed the meat, rusk, seasonings, colouring matter, and water into the bowl chopper. Mixing having been completed, the whole is passed to the filling machine from which it is extruded under pressure through a nozzle on to which is run the casing. For these products, natural casings only are used.

These arrive mostly from New Zealand or America salted down in barrels. Before they are passed to the filling machines, they are washed out, allowed to soak, and are then spooled on to nozzles by means of a stainless steel casing spooling machine which has been designed and erected by the company.

When the lengths of sausage emerge from the filling machine, they are broken off and weighed to just over 1 lb. lengths. This allows for evaporation which inevitably takes place before the product reaches the customer.

The sausages are then bundled in sixes or eights, labelled, and put on to trays which are loaded on to conveyors which take the products to the bottom of the building to the finished goods store.

Each bundling and labelling station in this department turns out something like two tons of sausages per day.

Pie Production

The meat used in the production of pies is boned, prepared, weighed up, and sent by elevator conveyor to the third floor where it is ground and seasoned. Flour and other ingredients for the pastry are brought by elevator to the mezzanine floor above. Flour is tipped into the hoppers, sieved, and fed into the mixers below. After moulding, the dough goes

A tray of liver sausage is emptied into a cooking tank.

Lowering cans of beefsteak puddings into a retort.

Weighing the day's yield of pressed beef.

Operatives in brown corduroy uniform work in the sausage cold room.

to the proving room and thence either to the dough breaks which roll the dough into shapes for the tops of the pies or to a series of machines where it is blocked to form the casing of the pies.

The raw meat and seasoning are fed into the dough casings, the tops are crimped on, and as they pass along by conveyor the pies are egg sprayed before being conveyed to the gas-fired travelling ovens.

For some pies, the meat is first cooked and fed by gravity from the mezzanine floor, through stainless steel chutes into hoppers which feed the meat into the pies.

A section of the despatch department.

Cooking and Cooling the Pies

After baking in the travelling ovens, which takes from three-quarters of an hour to three hours, depending upon the type of pie being cooked, they are removed from the ovens, packed into overhead racks, cooled, and transferred into the cold stores by means of the same overhead rails. Before placing in the cold stores, however, the jelly, which is made on the fourth floor from the pork rinds which have been allowed to simmer overnight and to which gelatine is added to bring it up to the required strength, is injected into the pipes. The solution is piped down from the fourth floor through stainless steel pipes to the operator on this floor.

The pies remain in the cold store until sufficiently cool for packing. Still on the overhead rails, they emerge from the store for packing in greaseproof bags; they are then packed into cartons and containers and are conveyed by elevator to the finished goods store on the ground floor.

This packing operation will shortly be made fully automatic by the use of a new machine, the first of its type, which will wrap and seal 2 lb. and 1 lb. pies in Cellophane at the rate of 40 pies a minute.

Sampling of the previous day's production is carried out daily.

Cooked Meats

On the fourth floor, which houses the cooked meats and canning department, are made the different types of luncheon sausage, liver sausage, and black puddings. For this, the preliminary operations follow closely the procedure for fresh sausage manufacture. The mixture is fed through bowl choppers and filling machines, both artificial and natural casings being used, depending on the trade that is being catered for. After filling, the sausages are conveyed to three sets of stainless steel tanks, each set containing six separate tanks, for cooking.

At the end of this operation, the sausages are placed on racks, cooled, and passed to the finished goods cold store.

A separate department has been allocated on this floor for the preparation of casings for use in cooked sausage manufacture.

Canning of Sausages

In the canned goods department, two lines dealing with A $2\frac{1}{2}$ cans of War Office sausage are at present being run. Cans are fed from the mezzanine floor by means of a chute after receiving

a preliminary internal greasing. After filling, the cans pass along the conveyor to the divider which is immersed first in hot fat and then into the cans of sausage meat. This divides the meat into segments, leaving a layer of fat between each segment. By this means it is possible, on opening the cans, to divide the contents into segments which are fried in the manner of individual sausages.

The cans are then conveyed to the vacuum sealing machine, the lids are coded and dated, and they are passed through washing machines into baskets which are carried by overhead conveyor to the retorts. On removal from the retorts, the cans are cooled, labelled, and packed into boxes which are wire strapped by means of an automatic wiring machine.

The water used for cooling the cans is passed over an atmospheric cooler on the roof of the building and is then recirculated for further use.

Beef Galantine and Pressed Meat

Other products such as beef galantine and pressed meat are also produced on this floor. For galantine, the mixture is filled into moulds and cooked in a water bath retort. It is then turned out and glazed with a white glaze. The meat for pressed meat manufacture is first brined, packed into moulds, pressed, allowed to cool, turned out, and finally glazed. All the moulds are sterilised in the retorts prior to packing.

Engineering Section

The basement which occupies some 22,000 sq. ft. is virtually a store. Other sections on this floor are devoted to space for a carpenter's shop, engineers' stores, and engineers' workshop. The company have their own engineering section to look after the boilers and refrigeration plant, and carry out general maintenance work. In this section there is also installed a washing machine for cleaning the trays and other food containers. In the near future the company hope to use nothing but aluminium trays both within the factory and in the delivery vans; this will considerably facilitate cleaning operations and keep the vans, which are at the moment in the process of being racked for this purpose, in the cleanest of conditions.

Distribution Arrangements

In the despatch department and loading yard, garage accommodation is provided for the entire fleet of delivery vans which are loaded from about 27 loading bays. Despatch of the company's products is carried out by rail during the day for delivery to country customers. About two-thirds of the supplies are distributed by van on the day following manufacture, the vans being loaded during the night so that the drivers can get away on their rounds first thing in the morning. These van deliveries cover the whole of the London area and the South coast from Kent to Dorset. Each van has a crew of one man and a boy, both of whom are smartly uniformed in brown bowlers in the winter and straw hats in the summer.

The remaining one-third of the trade is carried out throughout the whole of the British Isles, the output from the Acton, Willesden, and Godley factories coping with this vast network of distribution.

Five of the Festival of Britain concessionaires covering the restaurants at the South Bank and Festival Gardens are sending their meat to the factory for making into sausages.

The meagre supplies of today which are available for the production of sausages have necessarily cut down output considerably, but however small their customer, the company have always kept up supplies to everyone, even if it has meant in some cases a delivery of only 1 lb. of sausages.

SUPPLIERS OF EQUIPMENT

Elevators and overhead conveyors: *Geo. W. King.*
Weighing machines: *Hunt and Co. (Scales).*
Wire strapping machines: *Strappings, Ltd.*
Refrigeration: *Lightfoot Refrigeration Co.*
Time control (clocking in): *International Time Recording Co.*
Cans: *The Metal Box Co.*
Washing machines: *Robt. Kellie and Son.*
Cartons: *R. H. Filmer.*
Coke-fired boilers: *Brightside Foundry and Engineering Co.*
Grinders, bowl choppers, and fillers: *J. C. Wetter and Co.*
Bandsaw: *Wadkin, Ltd.*
Hoppers and mixers: *Artofex Engineering Works.*
Trucks: *Industrial Trucks, Ltd.*
Gas travelling ovens: *Pelkman Bros.*
Pie blocking and filling machines: *Peerless and Ericsson.*
Bagging machines: *Scientific Packaging.*
Pie wrapper and labeller (new machine): *Rose Bros. (Gainsborough).*
Cooking tanks: *A. Johnson and Co. (London).*
Recording thermometers: *Cambridge Instrument Co.*
Canning line: *Canco, supplied by The Metal Box Co.*
Retorts: *J. Fraser and Son.*
Labellers: *Beth Label and Wrapper Machines.*
Telescopic working platform: *Wm. Moss and Sons.*
Office lighting: *Crompton Parkinson.*

New Books Register

Orders for any of the books listed below, or scientific and technical books in any language, may be placed with the Books Department, FOOD MANUFACTURE, 17, Stratford Place, London, W.1. A selected stock of books is carried and may be inspected at the above address. Prices given do not include postage.

Hitchins, P. E. N. *Production of Tomatoes under Glass.* Ernest Benn, London. Pp. 179. Illustrated. 10s. 6d.

Sykes (Friend). *Food, Farming, and the Future.* Faber and Faber, London. Pp. 296. Illustrated. 21s.

Wallace, T. *Manuring of Food Crops.* Reprint. Growmore Bulletin No. 4, Ministry of Agriculture and Fisheries. H.M.S.O., London. Pp. 16. 6d.

Watson, S. J., and Smith, A. M. *Silage.* Crosby Lockwood and Son, London. Pp. 143. Illustrations and tables. 10s. 6d.

Samuels, H. *Factory Law.* Fifth edition. Stevens and Sons, London. Pp. xxviii+719. £3 3s.

TO AUTHORS

FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

Report on Weights and Measures Legislation

The Committee on Weights and Measures Legislation, appointed in 1948-49, recently presented its Report. As food is one of the principal commodities sold by weight or measure, considerable attention has been given in this Report to the distributive and manufacturing food industry's ability to meet tighter standards of weight or measure control.

WEIGHTS and Measures law has three objectives: to set up a uniform system of units of weight and measure throughout the country; to provide a general control for weighing and measuring equipment so that it accurately operates this national system for quantity measurement; and to protect the public against short weight or measure.

In 1878 a new Act was passed that repealed all previous laws about weights and measures; this Act consolidated a legal situation that had grown up in somewhat piecemeal fashion. Now, since 1878, there have had to be a dozen or so further Acts or Amendments. A position similar to that of 1878 has been reached—a new Act replacing and modernising all the 1878-1950 legislation is required.

The following is a brief summary of the Committee's main recommendations in so far as food (other than milk) is concerned.

Bread and Flour Confectionery

The 1926 Act required loaves to weigh 1 lb. or an integral number of pounds. This did not apply to loaves of 12 oz. or less, to pan loaves, to most kinds of fancy bread, or to the 1¾ lb. loaf in Scotland. Nor did it apply to bread sold under contract. Wartime orders modified the integral unit—from 1 lb. it changed to 14 oz. Also, the exempted types of fancy bread were considerably reduced in number. Despite this tightening up of legislation under emergency controls, wrapped bread has remained an exception to the fairly general rule that prepacked foods must carry a statement of weight or measure.

The Committee has taken the view that the 1 lb. loaf standard will shortly return. It recommends, therefore, that all bread, including fancy bread and sliced bread, should be sold by net weight only; that, as soon as is possible, all loaves and prepacked sliced bread shall be made up in weights of 1 lb. or multiples of 1 lb. only. As before, exemption is suggested for the loaf of 12 oz., for the Scottish 1¾ lb. loaf, and for bread sold under contract. It will be noted that there is no exclusion now recommended for fancy bread.

As bakers are aware, there is special protection for the trade under the 1926 Act for short weight indictments. This is a recognition of the difficulties of ensuring that each individual loaf will have an accurate weight. Courts must base any verdict not upon the weight of a particular loaf but upon the average weight of a reasonable number baked by a producer. After considering the records of this safeguard over a ten-year period the Committee concluded that it is still fair to both the bakers and the public and no change is therefore proposed.

The Committee does not consider it necessary for any varieties of flour confectionery to be sold by net weight only. Indeed, there was remarkably little discussion on this class of bakery goods.

Butcher's Meat

The 1926 Act required butcher's meat to be sold by net weight and it also made short weight an offence. However, there have been considerable exceptions under the definition of butcher's meat, *e.g.* kidneys, lights, pressed beef, and cooked meats. The Committee has paid close attention to this question of inclusion or exclusion from the net weight sale requirement; it is recommended that poultry, rabbits, and offal should now come within the scope of the 1926 Act. Game, however, is still thought best sold without compulsory weight statement.

Many people are unaware that wholesale transactions do not come within the scope of British weights and measures laws. All these Acts and Regulations apply to retail transactions only. On this point the butchers' organisations, while satisfied that fair weight was received from suppliers, pressed for wholesale consignments to come under the same laws as retail sales. This plea was endorsed by the Committee.

Fish Sales

The 1926 Act did not require fish to be sold by net weight. However, war-time controls, particularly the price control orders, made sales by weight virtually obligatory and universal. The evidence presented to the Committee clearly indicates that consumers wish this system to continue and that fishmongers see no objection to it.

The main problem in legislating for sales of fish by weight is found in the wholesale trade. As in other classes of trade, the retail fishmongers object to the exclusion of wholesale consignments from weights and measures control. Here, however, weight losses during transport—seepage and evaporation—make it impossible for a seller to guarantee a weight figure. The Committee has recommended that all such sales should be conducted in terms of net weight and that enforcement shall be based upon the principle that it is an offence for the packer at any stage of distribution to pack short weight.

Sales of fresh fish by "the kit" as first sales on landing would be exempt from these requirements; so, too, would sales of fresh herring by the cran. Although the sale of fresh fish in a standard container like the kit is not a satisfactorily accurate measure of quantity, the overriding factor in fish distribution at ports is speed

of handling to maintain freshness. It was felt that any change that necessitated weighing would lead to delays in distribution and serious impairment of fish quality.

Fresh Fruit and Vegetables

Although selling by weight is fairly general, there is no requirement in law (except under wartime Orders, most of which have now lapsed) for fruit or vegetables to be sold by weight except in the single case of potatoes. The Committee accepted the argument that certain classes of fruits and vegetables are unsuited for sale by weight and that sale by count in such cases is better. However, extensive lists of fruit and vegetables that could be sold by net weight only are put forward, and it is suggested that such a list should be the basis of legislation in this field. Also, the Board of Trade should have power, after consultation, to add or remove any particular commodity.

Here again retailers wanted wholesale trade to come under effective weights and measures control. It appears that the retailers' representations were very strong; it was stated that big discrepancies between stated and received weights were common. On the other hand, growers and distributors considered that net weight guarantees were impossible. Several factors entered into the matter, *e.g.* the use of casual labour in field packing, the loss of weight by evaporation, the variable tare weights of field containers owing to use in the open and in all weathers, and the despatch of commodities with ice, snow, or rain on them.

Net Weight for Wholesale Sales

These arguments, though real enough, resemble those of the fish distributors and the Committee has adopted a similar principle for control—a requirement that wholesale sales should be based upon net weight (for the same fruits and vegetables prescribed for retail sales by weight) but with enforcement limited to the packing stage. That is, it would become an offence for the grower or initial packer to pack short weight.

It was felt that the most important criterion of fruit and vegetable trade was quality and freshness. As standards of quality were best reached and maintained by good grading, it was felt that difficult weight requirements should not be imposed upon distributors, as these would inevitably retard progress in quality grading.

Prepacked Foodstuffs

The advent and expansion of prepacked commodity sales were recognised in the 1926 Act. Previously, the law had focused most attention upon the accuracy of the equipment used by shopkeepers in weighing, it being supposed that almost all retail sales by weight were determined by shop scales. The 1926 Act departed from this principle by making it an offence in the sale of any article of food by weight, number, or measure to sell less than is purported to be sold. Also, for prepacked and weighed articles of food, the statement is deemed to be that of net weight or measure unless otherwise indicated. It was required that prepacked articles of food should be made up in multiples of 2 oz. up to a total of 8 oz., multiples of 4 oz. up to a total of 2 lb., and multiples of ½ lb. up to a total of 4 lb. There were several exceptions. The operative principle was to enable the customer to distinguish weight differences by size of packet as well as by weight statement upon the packet.

Shorter Range for Prepacked Goods

In reviewing this special legislation, the Committee felt that the present "steps" of prepacking—the full range runs: 2, 4, 6, 8, 12, 16, 20, 24, 28, 32, 40, 48, 56, and 64 oz.—were too numerous. A much shorter range is recommended, namely: 2, 4, and 8 oz. and 1 lb. or multiples of 1 lb. A major problem is presented by the shopkeeper who prepacks on his own premises. To insist that each packet carries a net weight statement would throw a great burden upon him (so the Committee says, although in these days of gummed labels, printed tape, and even rubber stamps it is difficult to see just where the burden would be "great"!).

Development of Self Service

The new development in retail distribution — self-service — extends this problem. The Committee considers that in self-service stores prepacked goods should bear a statement of weight or be clearly grouped under some suitably designed weight ticket. The Committee is open to criticism here. The simplest way to resolve this variety of problems is to make the shopkeeper who prepacks in advance come under the same law as the manufacturer who prepacks, *i.e.* provide a weight declaration on the packet. There is then no need to reduce the range of prepacked weights that is permissible; nor will there be any need to legislate specially for self-service stores' own prepacked goods.

This point is not a petty one. The food manufacturer is losing flexibility if the range of legally prepackable weights is reduced. Why should he lose this advantage simply because it is said that retail shopkeepers cannot weight-mark their shop-made packets? The Committee considers that a 2, 4, and 8 oz. and 1, 2, 3, etc., lb. range is adequate, but with rising prices and supplies of some goods becoming scarce, a 12 oz. pack may be a highly desirable unit; so, too, may be the 1¼ lb. and 1½ lb. packs at present permissible.

In the matter of weight statements on prepacked goods, two recommendations will have the support of all reputable manufacturers. First, the marking of the weight on the bottom of the packet should be prohibited. Second, any statement of minimum weight or measure that is so much below the actual amount as to be grossly misleading should be made an offence, *e.g.* stating a minimum weight of ½ oz. for a packet weighing 2 oz., thus evading the intentions of the law.

The above regulations or proposed regulations for prepacked foods apply only to scheduled foods (unless future legislation

changes the principle of present law) and the Committee received many representations from housewives, local authorities, retailers, etc., for more prepacked foodstuffs to be sold in specified weights only.

Foods in Rigid Containers

The Committee decided to exclude from any such recommendations all foods prepacked in rigid containers such as cans or jars, although there are a few exceptions to this exclusion. It was felt that progress currently being made in standardising the sizes and designs of these containers would be damaged. On the other hand, it was recommended that at the end of five years the Board of Trade should review the position and decide whether further commodities packed in rigid containers could be brought within the specified weight requirements of prepacked foodstuffs.

Another class of goods recommended for exclusion are those made up to a weight which is part of a formula for household mixing with other ingredients, *e.g.* soup powders, custard powders, and the like. Other excluded classes are goods made up in quantities suitable for one person, *e.g.* small cans of beans; and packages containing small numbers of large units whose weights tend to vary in manufacture, *e.g.* biscuits.

Additions to Prepacked Food Range

The additional foods the Committee recommends for prepacking in the specified range of weights only are as follows:

(1) Net weight: jam (other than diabetic jam), marmalade (other than diabetic marmalade), jelly preserve, honey (other than in comb), syrup, treacle, gelatine, salt (other than cut lump salt), pepper, mustard powder, mustard powder compounds, spices, cream of tartar, dried herbs, curry powder, potato crisps, Christmas puddings, and custard, blancmange, and junket powders (other than in containers holding less than 4 oz. or holding a number of separate packets holding less than 4 oz. each).

(2) With wrapper allowances: nut butter, potato flour, oat flakes and flour, pearl barley, ground rice, baking powder, raising powder, nut kernels, split peas, dried lentils, cheese (including processed cheese), dripping, meat and fish paste, and cooked and processed meat (other than in cans or glass containers), desiccated coconut, arrowroot, and bicarbonate of soda.

In addition, it is recommended that legislation should permanently provide for prepacked foods to have indications of minimum net weights or measures, but the Committee suggested the exemption of the following: bath chaps, biscuits sold by the packet or by the piece for a price not exceeding 3d., honey in comb, meat pies, single toffee apples, uncooked beef or pork sausages, whole cooked beetroots, and microbiological preparations for addition to food.

Canned Fruit and Vegetables

The Committee has recommended that the war-time provisions for minimum filled weight standards and solid contents of cans should be given legislative permanence, preferably within the framework of weights and measures law. Also, for fruits or vegetables canned in water, a statement of minimum filled weight only should be required; whereas for fruit canned in syrup, the syrup being an essential part of the edible matter, a statement of total net contents should be all that is legally required.

Chocolate and Sugar Confectionery

Chocolate and sugar confectionery are not covered by the 1926 Act; when prepacked, they are still exempt from the requirement of net weight statement on the container. The Committee received recommendations that all sales should be by weight only and that steps should be taken to prevent sales in excessively heavy wrappings.

The production of blocks and bars to standard and accurate net weights is difficult for smaller manufacturers without elaborate machinery; also, for articles weighing less than 4 oz. the consumer cannot be given full value for his money unless manufacturers are able to vary weight within the cost limits set by the smallest unit of currency. This consideration is of powerful significance under today's fluctuating conditions of costs.

The Committee did not fully accept these arguments, but the recommendation made has not ignored them. It is proposed that blocks, bars, and count lines should be sold to specified net weights (like prepacked goods) with the exception of those made up to 3 oz. or less. No wrapper allowances should be given in sales of any of these commodities. Also, wrappers or containers should bear an indication of minimum net weight.

Chocolate or confectionery prepacked in tins or boxes should be sold by weight only, and the net weight given on the pack should correspond to the weight of the contents exclusive of any wrappings round the individual sweets inside the container. This recommendation clearly aims at the deceptively voluminous pack.

Dear Sir . . .

A LITTLE handbook* on letter-writing, which indicates the method of avoiding the Scylla of pompous language which was the rule at the beginning of the century, and the Charybdis of the curt and telegraphic style of today, has recently been published.

The impression which a business letter, and indeed a letter of any description, makes upon its recipient is an important one, as it may affect the purpose for which it was written. This book starts off by showing how the "heads and tails" (as the author calls them) of letters should be presented; after which are chapters on the misuse of common words, on errors in punctuation and grammar, and on literary style (not out of place in business letters). All this is packed in 93 pages, to which even the experienced writer might well refer with advantage from time to time.

* *Letterwriting*. By G. O. E. Henderson. Pp. 93. W. and G. Foyle, London. Price 2s. 6d.

The Food Group in Italy

W. Leonard Hill

Sforzesco Castle, Milan. *Photo Enit.*

IT WAS in Milan that the Food Group of the Society of Chemical Industry established their headquarters during their annual tour in June.

Arriving bright and early on Saturday, June 2, we spent the day exploring the city. Starting from the splendid Piazzo Duomo from which a number of streets radiate in all directions, we visited the cathedral, which, with the exception of St. Peter's in Rome and the cathedral of Seville, is the largest church in Europe.

For those interested in churches, palaces, and art galleries, Milan is a city which would take a year to study, but the Food Group had other work to do —perhaps never before has a group of investigators covered so much ground in so short a time, and seen such a varied range of industrial and agricultural activities as in the week we had available.

Before the real work of the tour started, Sunday was spent in visiting Lake Como. After a pleasant and invigorating steamer trip from Como, our party arrived at Bellagio, where lunch was offered by the Italian Travel Bureau at the Hotel Splendide. After lunch we crossed the lake by motor launch to visit the Villa Carlotta, where an all-too-brief visit was paid to the beautiful gardens.

Monday was a full day, starting with a trip to the Galbani Company's pig farm and cheese factory at Corteolona. The journey led us through rice growing country, where we saw rows of short-skirted, barefooted women stooping to plant the rice. The various stages on these plantations, ranging from the preparation of land for planting to the plants already growing a foot high, could also be seen.

The Galbani Company have brought the breeding and feeding of pigs to a high art. Their stock is based on the Large White, crossed with the Poland Spot, a breed not unlike the Gloucester Oldspot in appearance. There has been a certain amount of crossing with the Chester, an American breed. They kill at about 12½ score. This may seem a great size according to English standards, but is most suitable because of the value of the fat for lard and for the Salami trade.

Much of the feed is imported,

The Cathedral, Milan. *Photo Enit.*

Argentine maize and locust beans being used as well as home-grown grain. The food is carried from the store by elevator to a mixer of large capacity. Fifty tons of liquid mix a day are made and the mash pumped through pipes to the feeding troughs, the feeding of any one pen taking no more than ten minutes. The pigs are then released into the open dunging yard, passing out at another door to return to their original pens.

The milk and cheese plant at the Corteolona factory and cheese maturing stores is of Danish manufacture; extremely well laid out, it was of a high standard of cleanliness, like everything else seen in Italy. One thing that impressed us was the amount of hand labour involved, the vast number of heavy cakes of Parmesan cheese being turned every three or four days and, after a year, every eight days. There was considerable speculation as to the cost of

At the Galleria, a favourite rendezvous in Milan. *Photo Leonard Hill.*

The Scala Theatre, Milan. *Photo Enit.*

labour and the amount of capital involved.

After an excellent lunch at which Dr. Santi welcomed us, and for which Mr. Harold Morgan offered thanks, we visited the beautiful church and cloisters of Certosa di Pavia, one of the greatest monuments of Northern Italy. The party then proceeded to the Pavia factory of the Galbani Company where processed cheese is made and packed.

Flour and Sugar Confectionery

On Tuesday a visit was made to the Motta Company of Milan, who employ some three thousand workers in making *panettoni** (a special fruit-loaf), as well as flour and sugar confectionery and ice cream. Again the impression gained was one of tidiness and cleanliness.

Panettoni are highly popular in the Milan area, and at Christmastide everyone, rich and poor, has a large *panettone* on his table. When we sampled this, among other delicacies, at the open-air tables in the cathedral square, we decided that it was a superlative Grannie's Bread which we had known in our childhood days in the North of England.

In other departments we saw the production of ice cream, cakes, candies, nougats, and dragées. In addition to chocolate-coated blocks, cups, and gateaux, the company is following the American practice of making ice cream on sticks. The stick filler we saw in action was novel and very efficient.

After the excellent lunch offered by the company, a visit was paid to the Casatenovo Brianza factory of F. Vismara, which produces a wide range of hormones and biologicals from animal organs and tissues.* The daily slaughter of 1,500 pigs used for the manufacture of meat products provides a large and regular supply of glands for therapeutic purposes. The pharmaceutical plant and the chemical manufacturing section are of the latest design.

The meat products manufactured include a large number of different kinds of Salami, Morta-

* A full description of this factory and the manufacture of *panettoni* was published in FOOD MANUFACTURE, March 1948.

* Reference to the work of this factory was made in the July 1951 issue of MANUFACTURING CHEMIST.

The bakery section in the Motta factory.

The party arrives at the Cinzano factory. *Photo Leonard Hill.*

della, and similar items, as well as tinned ham.

This company's hospitality extended not only to the giving of an excellent tea, but also to the presentation of a silk scarf to each member of the party. A vote of thanks, proposed by Dr. H. E. Cox, was replied to by Prof. Soldi, technical director of the company.

During the evening a reception to the Food Group was given by the Mayor of Milan at the ex-Royal Palace in the Via Palestro at which Dr. d'Ambrosi, representing the Mayor, replied to the vote of thanks proposed by Mr. A. L. Bacharach.

Vineyard Visit

An outstanding day of a crowded week, Wednesday was devoted to a visit to the Cinzano factory, the coach journey to San Vittoria taking us through part of the highly cultivated Po valley and the typically Italian vine growing region surrounding Asti. Cinzano have erected close to the works quite a little township where the employees are housed. The factory is situated at the foot of the hill of Santa Vittoria d'Alba. The southern slope of this hill forms part of the agricultural estate of the company and is kept as a model vineyard; here is cultivated the Pinot stock from which is obtained the fruit for the sparkling wines. The cellars have a total capacity of approximately 2½ million gallons, divided into 222 tanks, and the underground cellars, excavated in the hill, accommodate some millions of bottles of sparkling wine. Three qualities of Vermouth are produced: red, white, and dry, the first being the classic product which has for more than a century been known as the typical Vermouth.

Tomb of Paganini, Palma. *Photo Enit.*

During the lunch offered by the company, at which Mr. Heydon, British Vice-Consul at Turin, joined us, members had ample opportunity to appreciate the excellence of the different Cinzano wines. The vote of thanks was proposed by Mr. A. P. Buchanan, and was replied to by the general manager, Dr. Ricardone.

Rice Research

After lunch, the Rice Research Station at Vercelli was visited around which we were conducted by Prof. Borasio. The main activity of the Station is the carrying out of research with a view to selecting the varieties most suitable to be grown in the different provinces and districts.

From the Station we proceeded to the rice mill of Viazzo Alessandro and Figli, and made a rapid survey of the various operations. We saw the special machines used for husking, for milling or whitening (removing the cuticle by attrition), grading, polishing, and facing. Grading is necessary to remove the rough broken rice which is then further graded as to size and finally put on the market as "broken rice," of which there are several classes. The rice bran, which contains small broken grains, is used as a cattle food and is in much demand for the manufacture of special feeding cakes. The broken rice is used for brewing and distilling, and for the manufacture of starch and rice flour.

At the conclusion of this visit a vote of thanks was proposed by Mr. H. C. Moir; this was responded to by Signor Nino Viazzo.

In the evening there was a meeting with the Italian Chemical Society presided over by Prof. Arnaudi. A short lecture on "Chemical Aspects of Quality Payment for Milk" was given by Dr. J. G. Davis, and was followed by a discussion in which Dr. d'Ambrosio was the main speaker.

Tomato Paste and Preserved Foods

Thursday was a long day, the first visit being to the Locatelli

tomato paste factory at Cadeo, where refreshments were provided by the company, Dr. Ing. Cerino replying to the vote of thanks proposed by Mr. C. J. Regan. Afterwards a visit was paid to the Experimental Station for Preserved Foods, Parma,* round which we were conducted by our good friend and contributor, Dr. Ing. Emanuele. In the laboratories extensive research is being carried out on all aspects of food preservation. It was pleasant to renew our acquaintance with Dr. Emanuele and also with Dr. Borri and Signorina Franca Secci, the interpreter to the Tourist Bureau at Parma.

Lunch was provided by the Bureau, Mr. Leonard Hill proposing the vote of thanks, and Signor Jenni, Vice-President of the Preserved Foods Exhibition, replying.

Mr. A. L. Bacharach (chairman of the Food Group) proposing the toast of the Italian Chemical Society. *Photo Crovini.*

Manufacture of Food Plant

From the Experimental Station a visit was made to the Manzini food machinery factory, which greatly impressed us as being one of the cleanest and most orderly machine shops we had seen. Signor Manlio Manzini replied to a vote of thanks proposed by Mr. R. D. Mason.

Salsomaggiore Spa

After a visit to the cathedral and other places of interest, we departed for Salsomaggiore Spa, where the Berzieri Thermae was visited. Following cocktails at the Grande Hotel Thermes, we partook of a dinner offered by the Berzieri Thermae at the Taverna del Cacciatore on Diana Hill. A vote of thanks proposed by Dr. G. M. Dyson was responded to by Dr. Borri, head of the Parma tourist organisation. The Mayor of Salsomaggiore, who was also present, addressed the company.

On Friday morning we left to visit the San Pellegrino mineral water factory. The coach drive consisted of a run to Bergamo on the *autostrade* and then a drive up into the lower Alps through beautiful scenery to the village of San Pellegrino itself.

The factory manufacturing the well-known Pellegrino mineral water is of modest design, and further extensions are envisaged to cope with the ever increasing demand. The mineral water is obtained from a local spring, and incidentally the same water is used for spa treatment at the thermal establishment adjoining the factory.

The bottling machinery, all of recent American design and delivery, was viewed with envious eyes by those who know the difficulty of obtaining such plant in Great Britain. Bottling is carried out on 45-head Crown Cork units into litre and half-litre bottles with low pressure carbonation of the spring water. Capping and labelling are carried out on automatic machines, and an interesting feature is the hot air tunnel through which the bottles finally pass to dry and fix the labels.

Other soft drinks are also made at the factory, and the carbonated orange squash contained a substantial proportion of orange juice prepared by the company themselves. Their factory in Milan extracts the juice from oranges, concentrates it under a vacuum, and delivers it to San Pellegrino, where it is stored in a refrigerator until required.

At the lunch, Mr. S. W. Butterworth thanked our hosts and Count Citterio, administrative director of the company, responded.

The Work of FAO

On Friday afternoon we gathered to hear Dr. van Veen speaking at the Polytechnic on the work of the Nutrition Division of the FAO, Mr. A. L. Bacharach occupying the chair. This was an interesting meeting at which Mr. Hill, Dr. Dyson, Mr. Regan, and Prof. Quilico (Professor of Organic Chemistry at the Polytechnic) contributed to the discussion. A vote of thanks was proposed by Mr. T. McLachlan.

The Final Dinner

According to custom, the Food Group offered a dinner to their various hosts. The toast of the Italian Chemical Society was proposed by Mr. A. L. Bacharach, chairman of the Food Group, and was responded to by Prof. Adolfo Quilico, Vice-President, Lombardy section of the Societa Chimica Italiana. Prof. Quilico proposed the toast of the Food Group, which was acknowledged by Dr. H. E. Cox. The toast of the guests was proposed by Dr. Cox and acknowledged by Mr.

(*Concluded on page* 318)

* The work of this Station was described in FOOD MANUFACTURE, January 1951.

Wheat and Oatmeal Research

THE production of wheaten flour, originating in antiquity, has gradually evolved until now it is a complex, completely mechanised process of repeated grinding and fractionating of the ground products, the ultimate aim being to divide the grain as closely as possible into its structural parts. In the production of the finer grades of white flour, only the endosperm is used, the skins (pericarp and testa), the underlying aleurone layer, and the future plant or germ, consisting of embryo and scutellum, being almost completely excluded.

Distribution of Nutrients

As nutritional science developed it was found that the process of refining white flour also excluded the greater part of the vitamins of the grain which are principally those of the B group. This fact was of particular importance during the war with the limited range of foods available and research was carried out to ascertain the precise distribution of the nine important nutrients in the wheat grain.

This requires skilled micro-dissection. The grain is dissected by hand into its main structural parts and micro-analytical procedures allow a vitamin assay to be carried out on the fractions so obtained. Eighty per cent. of the grain is endosperm and only 1·5 per cent. is scutellum, but the outstanding fact is that the concentration of vitamin B_1 in the scutellum is 1,500 times as great as that in the central endosperm. Sixty-six per cent. of the total vitamin B_1 is in the scutellum and only 3 per cent. in the endosperm.

The implication of these results is that the scutellum is the all-important part of the grain when vitamin B_1 is under consideration. If means can be found of isolating this fraction of the grain during the milling operations, the major part of the natural B_1 content of the grain could be directed into whatever type of flour, irrespective of colour or grade, the industry was called upon to produce.

One method of doing this has been achieved in the laboratory. This is known as a moist surface separator and relies upon the fact that scutellum particles stick more firmly to a moist surface, in this case a broad rubber band, than do endosperm and bran particles; the latter are therefore more readily brushed off the band.

Structure Influences Nutrients

The Research Association of British Flour-Millers is continuing these distribution studies. Eighty per cent. of the nicotinic acid in wheat has been found to be in the aleurone layer. The distribution pattern of these nutrients is also shown to be similar to other cereal grains, in particular rice, where 80 per cent. of the total B_1 is confined to the scutellum and aleurone layer—parts normally removed during preparation of the grain for food.

These latter findings have not yet had time to affect industrial practice, but their implications are similar; important nutrients are shown to be substantially identified with particular structures of the grain, and the engineering problem in the preparation of products of a given nutritional standard is thus defined in terms of the structural parts of the grain required.

Rancidity in Oat Products

As in many other instances, with oatmeal it is necessary to obtain an insight into its fundamental properties in order to enable the practical problems of the oatmeal millers to be tackled. One of these problems is the development of an "off" or rancid taste; this is due to the production of free fatty acids by the action of the enzyme lipase and may occur in a matter of weeks in oat products which have been inadequately kilned or steamed.

The Research Association, in the course of its investigation into this problem, has developed a new method for measuring lipase activity in oat products. Using this method it is possible to predict if a sample of oatmeal or flakes will store well or if it is likely to develop a soapy taste.

A survey of the distribution of lipase activity within the oat germ has also been carried out, and this, combined with the knowledge of the distribution of fat within the germ, has made it possible to develop a special process for the destruction of lipase activity.

Protein Content

Work on the protein, fat, and mineral content of oats has also been carried out, and the amino acid composition with respect to eighteen of the amino acids known to occur in protein has been determined over a range of groat samples covering various types grown in Great Britain. This work has also extended knowledge of the relations between the nitrogen content of the oats (which is normally used as an index of the protein content) and the actual protein content.

This paper was one of the series on "Scientific Problems in D.S.I.R." described by Sir Ben Lockspeiser, K.C.B., F.R.S., to the Scottish Branch of the Institute of Physics.

The Food Group in Italy

(*Concluded from page* 317)

Sebastian, British Consul-General in Milan.

Throughout the tour everybody was most helpful and we should especially like to mention Dr. Emanuele, Dr. G. Coppa Zuccari, Prof. Pratolongo of the Department of Agricultural Chemistry, Milan University, and Dr. Cassinis, President of the Polytechnic.

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The Tools of the Food Chemist

A. McM. Taylor, B.Sc., Ph.D., F.R.I.C.

Part II

IN THE examination of sugar products two instruments are of great importance—the refractometer and the polarimeter. The refractive index of a sugar solution is an index of its concentration. In two current Statutory Instruments (The Food Standards (Preserves) (Amendment) Order, 1950, and the Food Standards (Table Jellies) Order, 1949) a specification for "total soluble solids" determined by refractometer reading is included in the statutory requirements.

The type of refractometer most generally employed is the Abbé pattern, operating by transmitted light.

Small pocket refractometers are available; the upper prism is mounted in the tube of the observing telescope and the lower prism is hinged for insertion of the sample. These little refractometers have no mirror, being pointed directly at the source of light for observations.

A useful modification is the reflection refractometer, illuminated internally by a small built-in electric lamp. In this instrument the light does not have to pass through the specimen, which may therefore be opaque. Thus, with a material such as fondant, containing excess sugar in the form of fine crystals, the concentration of dissolved sugar in the syrup phase can be directly determined.

The Polarimeter

The polarimeter has for many years been the standard instrument for sugar analysis. It depends on a measure of the amount by which the plane of vibration of plane polarised light is rotated in passing through the test solution.

A considerable improvement in polarimeter construction is the replacement of the older calibration scale engraved on metal by a transparent scale etched on glass. This scale is viewed by transmitted light and is very much easier to read than the metal scale.

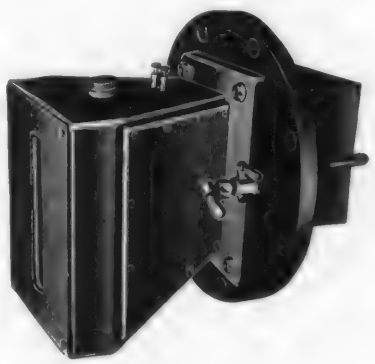
The biggest advance, however, is undoubtedly the introduction of the sodium vapour lamp to replace the erratic sodium flame formerly used as a source of monochromatic light; the sodium lamp gives even illumination of high intensity and considerably improves the ease and accuracy of operation.

Vitamin Assays

Not all of the vitamins are amenable to chemical determination but vitamins A, C, and a few of the B group can be estimated chemically. Vitamin C is estimated titrimetrically with 2:6 dichlorophenol-indophenol and requires no special apparatus.

Vitamin A can be estimated by the blue colour developed with antimony trichloride, the colour being measured in a Lovibond Tintometer or other colorimeter. The colour is, however, very transient and a much more satisfactory measurement is by means of the ultra-violet absorption of the vitamin at wavelength 328 mμ. This estimation requires an ultra-violet spectrophotometer.

Most commercial instruments employ a specially cut "constant deviation" prism; using a fixed light source the spectrum can then be passed over a fixed slit by simply rotating the prism and the operating mechanism can be calibrated to show directly the wavelength of the light entering the slit in any position; this device considerably simplifies the construction and operation of the instrument.



A pan refractometer.
Photo Bellingham and Stanley.

Two of the B group vitamins, aneurin and riboflavin, can be estimated fluorimetrically, and the Spekker photoelectric colorimeter can be adapted for this purpose. The measuring photocell and test cell carrier are removed and replaced by an alternative arrangement having a photocell mounted parallel to the incident light beam and hence illuminated only by the fluorescent light emitted by the test solution. The normal light source is similarly replaced by a mercury vapour lamp to provide ultra-violet light. The response from the measuring photocell is very small and neutral filters must be placed in the compensating beam to enable a balance to be obtained. The overall sensitivity of the instrument is very much reduced and an extremely sensitive mirror galvanometer is required.

An alternative procedure which has now been developed for the assay of riboflavin and nicotinic acid is the microbiological method. In this method the concentration of vitamin is assessed by the growth response of a micro-organism supplied with all other nutritional requirements except the particular vitamin being assayed. The growth of the organism, after suitable incubation, can be determined from the turbidity of the test solution, and this can be measured in a photo-electric absorptiometer such as the Spekker. A deep red filter should be used and if possible the absorption of a similar test solution clarified by centrifuging should be determined and deducted as a blank correction.

Ancillary Instruments

A number of other instruments used in the examination of foodstuffs are not strictly covered by the term "analysis." Some of

At work in a large scale food laboratory. *Photo J. Lyons and Co.*

these, such as viscometers, plastometers, jelly testers, dough testers, and so on, are highly specialised and serve only a limited field of interest. Two ancillary instruments are, however, very widely employed; they are the microscope and the *p*H meter.

The Microscope

Microscope construction and operation have to a large extent been standardised for many years; a comparatively recent development which may prove of considerable interest is phase-contrast microscopy. The microscope is modified by inserting a specially cut "phase-changing" plate (which may be of quartz) in the back focal plane of the objective, with the object of imparting a difference of intensity to rays proceeding in slightly different directions. For objects showing only small differences in refractive index this is said to result in enhanced contrast without loss of resolving power and the method should, in this event, be of value in the examination of yeasts and other micro-organisms.

The *p*H Meter

The determination of *p*H is of very considerable importance in food technology and a number of alternative commercial instruments are available. Most, if not all, of these instruments use a glass electrode; the earlier quinhydrone and hydrogen electrodes are practically obsolete in commercial practice. The glass electrode consists of a thin film of special glass in the form of a bulb containing a solution of constant *p*H value (commonly 0·1 N hydrochloric acid). When this bulb is immersed in a test solution a potential difference is developed across the glass film which depends on the *p*H of the external solution. To measure this potential difference electrical connexions are required with both solutions. Internal connexion may be made through a silver/silver chloride electrode and external connexion through a calomel half-cell linked by a salt bridge.

The overall potential difference of this system is still dependent on the *p*H of the test solution and the measuring instrument, which usually incorporates a valve unit, can be calibrated to indicate directly the *p*H of the test solution.

A portable pH meter.
Photo Cambridge Instrument Co.

The more elaborate instruments usually employ a null point system, the e.m.f. to be measured being balanced against a standardised potentiometer circuit. Some of the simpler instruments, however, have a deflecting meter directly calibrated in *p*H units. With an instrument of this type after switching on, checking for battery variations and sensitivity, and setting the temperature compensator, the electrodes are immersed in a buffer solution of known *p*H and the instrument adjusted to this reading by a special control; it will then indicate directly the *p*H of any other solution in which the electrodes, after suitable rinsing, are placed.

General Laboratory Apparatus

One of the most useful developments in laboratory glassware has been the manufacture of a wide range of flasks, condensers, stillheads, and adaptors with standardised interchangeable ground glass joints; to increase the flexibility of all glass apparatus, vacuum-tight glass universal joints are also available.

Another useful item for apparatus assembly is laboratory scaffolding, in which a single rigid structure built up with clamping bosses replaces the multiple retort stands formerly employed.

(*Concluded on page* 325)

Food Controls in Great Britain

C. G. Daubney, M.Sc., F.R.I.C.

Part I

In this series of articles, the first of which deals with Control of Food Orders, a general review will be given of the various Government controls and regulations, relating to foodstuffs, which are at present in operation and of some of the chemical problems arising from their enforcement. Orders concerned solely with rationing are not dealt with.

FOLLOWING the outbreak of World War II in September 1939, the regulation of the production of foodstuffs and their price control and rationing in the United Kingdom became a matter of paramount importance, and the Defence (General) Regulations 1939 gave the Minister of Food all the necessary powers in this connexion. Statutory Rules and Orders (later to be known as Statutory Instruments) at once began to appear dealing with production, price, etc., until virtually all foods were controlled to a greater or lesser degree.

Enforcement of Controls

Since the end of the war the food position has improved to some extent so that some of the Orders have been revoked, but even today many controls still remain to regulate food supplies.

To enforce these controls it is often necessary to establish the nature of a given product by chemical analysis or by some other form of examination; this work is carried out by the Government Chemist or by Public Analysts. When any legal proceedings are taken for an infringement of an Order, evidence is produced in Court either by the presentation of a Certificate of Analysis or by the attendance of the analyst as a witness.

Powers of the Ministry of Food

In 1943 it was decided to make the Minister of Food responsible for the protection of the consumer against false and misleading descriptions and to exercise powers to make regulations dealing with the composition and labelling of foods. This decision was made effective by Regulations 1 and 2 of the Defence (Sale of Food) Regulations, 1943 (S.R. & O. 1943, No. 1553).

Under Regulation 1 it became an offence to display a label which falsely described any food exposed for sale and which was misleading as to the nutritional and dietary value of a food.

Powers were given to the Minister of Food under Regulation 2 to make Orders concerning the composition and labelling of foods and resulted in the issue of:

(*a*) Standards Orders, to be read as one with the Food Standards (General Provisions) Order 1944, dealing with specific items of food.

(*b*) The Labelling of Food Order.

(*c*) Certain miscellaneous Orders dealing with the purity of foods and their fitness for human consumption. At present these relate to the limiting of the fluorine content of acidic phosphates and the like used in foods; and to the permitted quantity of mineral oil in certain foods.

Other aspects of food control are to be found in the Public Health Regulations dealing with preservatives, condensed milk and dried milk, the Food and Drugs (Milk and Dairies) Act, and the Food and Drugs Regulations concerning raw, pasteurised, and sterilised milk, condensed and dried milk, and certain other products.

Linked with the foregoing Orders and Regulations are those dealing with the manufacture, licensing, price, and rationing of animal feedingstuffs. Such products may contain a complex mixture of cereal products, legumes, oilseed meals, meat and fish products, and dried milk products; identification of the components requires much experience in the microscopy of these ingredients.

The significance of any Order is, of necessity, bound up with the definition of the food in question. Most of the definitions are given in full, but those which have been abbreviated are marked with an asterisk.

For each foodstuff, the number of the principal Order and of the latest amendment (if any) is given.

BACON AND HAM

(S.I. 1950 No. 770; S.I. 1951 No. 75)

The Order controls the production and price of bacon.

BANANAS ORDER

(S.I. 1948 No. 1628; 1951 No. 525)

"Bananas" does not include bananas that have been dehydrated or otherwise processed.

The Order controls the price of bananas at all stages of distribution.

BISCUITS

Licensing Order, 1951 (S.I. 1951 No. 606)

"Biscuits" includes shortbread of an individual weight not exceeding 2 oz., wafers, rusks, crispbreads, oatcakes, matzos, and biscuits wholly or partly covered with chocolate; but does not include petits fours or similar products, medicinal biscuits (other than diabetic biscuits), biscuits of a description used only for feeding animals, or rusks of a description commonly used as a filler in the manufacture of articles of food containing meat or fish.

A licence is required to manufacture biscuits, but this does not apply to caterers.

Prices Order, 1951 (S.I. 1951 No. 607)

Biscuits must not be sold by retail at a price exceeding the maximum price specified in the Order. These prices are fixed by the Cake and Biscuit Alliance Ltd., who deal only with those biscuits known as "classified products" and not with "unclassified products," including salvaged biscuits.

Certain relaxations are permitted in the case of broken biscuits, but biscuits must not be mixed.

Biscuits must be properly described and labelled with details of the product group, the approved name or mark of the manufacturer, and the maximum price.

Biscuits (Charges) Order, 1944 (S.R. & O. 1944 No. 1380; S.I. 1951 No. 647)

As from April 15, 1951, a licensed biscuit manufacturer pays a charge at the rate of 45s. per 280 lb. of flour used in the manufacture of biscuits during any ration period, this representing the flour subsidy.

BREAD

(S.I. 1951 No. 258; S.I. 1951 No. 1077)

"Bread" includes rolls but not fruit loaves or bun loaves.

"Loaf" includes wrapped sliced bread.

*"National bread" means bread in the production of which

(i) at least 87½ per cent. of flour used is national flour,

(ii) no ingredients besides national flour used other than imported flour, oils and fats, water, salt, yeast, improvers of the nature of yeast food, suitable acidic substances, potato or potato flour, barm.

"Rye bread" means bread in the production of which at least 25 per cent. of flour used is rye flour or rye meal or both.

For "National flour" and "'W' flour," see Flour Order, Not more than 25 per cent. of the flour used in a loaf or other unit may be imported flour. Provisions as to weight are as follows:

Description.	*Weight.*
Loaf (not Vienna)	14 oz. or multiple; 2 oz. or less
Vienna loaf ..	7 oz.
Bap or other roll..	not exceeding 2 oz.
Bap (Northern Ireland)	5 oz.

Maximum prices are prescribed for 3½ lb., 1¾ lb., and 14 oz. loaves and other permitted weights. These maxima vary according to locality, *viz.* N.I., Holy Island, Northumberland, and certain areas in England, Scotland, and Wales.

An extra charge can be made for bread completely wrapped in waxed paper or cellulose film and for pan loaves in Scotland.

The Order does not apply to certain special breads such as protein enriched bread, *i.e.* with not less than 20 per cent. protein, Gold Label bread (Starch Free Foods Ltd.), and Longuets, etc. (Heudebert Foods Ltd.).

The maximum prices provisions do not apply to bread in which no National flour or "W" flour is used, rye bread, malt bread, certain gluten breads, and special description breads.

BUTTER

(S.I. 1951 No. 801)

"Butter" includes whey butter.

"Farm butter" means any butter manufactured by a farmer on his farm premises from milk produced by him.

"National butter" means butter which has or shall have been requisitioned, bought, or otherwise acquired by the Minister.

*"Prepack" means pack or make up in a wrapper in any quantity of 1 lb. or less. (This does not include the packing of farm butter.

A licence is required to manufacture for sale any butter other than farm butter, to prepack butter (other than in Northern Ireland), and to buy or sell any butter if the same is outside the U.K.

Maximum prices have been fixed for butter.

National butter or butter blended with National butter must be correctly marked.

Under the Food and Drugs Act, butter must not contain more than 16 per cent. water.

CANNING OF FOOD AND FEEDINGSTUFFS

(S.R. & O. 1942 No. 2186; S.I. 1949 No. 2133)

A licence is required to engage in the canning of food or of feedingstuffs, and the Orders provide for the sampling of the food before and after canning.

CEREAL FILLERS

(S.I. 1951 No. 51; S.I. 1951 No. 580)

"Cereal filler" means any baked rusk, meal, or crumbs of a description commonly used as a filler in the manufacture of articles of food containing meat or fish.

No licence is required to manufacture cereal fillers, but a permit is needed for the use of flour therein. The use of soya flour, other soya products, and colouring matter is not permitted in their manufacture.

Maximum prices are laid down except in the case of prepacked products.

CHEESE

(S.I. 1950 No. 1069; S.I. 1951 No. 728)

"Cheese" means:

(i) any cheese of the following varieties, whether home produced or imported—Cheddar, Cheshire, Lancashire, Derbyshire, Leicestershire, White Wensleydale, and Dunlop;

(ii) any processed cheese, that is to say cheese which after manufacture has been heated and to which an emulsifying agent has been added, including imported prepacked processed cheese of any of the varieties set out in (i) above, but excluding any other imported prepacked processed cheese.

"Prepacked" means packed in advance by the processor ready for retail sale

(i) in a wrapper or container containing a net weight not exceeding 8 oz; or

(ii) in a wrapper or container containing a number of portions each in a separate wrapper or container and each of a net weight not exceeding 8 oz.

A licence is required for the production of cheese, and maximum prices have been fixed for (*a*) White Wensleydale, (*b*) any other variety of cheese.

Cheese also comes within the Fats, Cheese, and Tea Rationing Order, 1951 (S.I. 1951 No. 856), wherein it has a slightly different definition as follows:

*"Cheese" means any of the varieties given in (i) above and (ii) any processed cheese, that is to say cheese which after manufacture has been heated and to which an emulsifying agent has been added, of the varieties set out in (i) above.

Under the Use of Milk (Restriction) Order (S.R. & O. 1945 No. 304), a prohibition was laid on the use of condensed milk and milk powder in the preparation of soft cheese and curd cheese. This restriction has been suspended until further notice by S.I. 1950 No. 1457.

There is no statutory standard for the fat content of cheese, but it is generally accepted that a minimum of 45 per cent. fat on the dry substance is desirable.

CHOCOLATE, SUGAR CONFECTIONERY, AND COCOA PRODUCTS

(S.I. 1951 No. 417)

"Chocolate and chocolate confectionery" includes medicated chocolate confectionery, but does not include chocolate prepared for use in making a beverage, chocolate couverture, any product of a description specified in the First Schedule of this Order (see †), or any product which would not be regarded in the confectionery industry as suitable for retail sale without further processing.

"Chocolate couverture" means a chocolate product sold in accordance with trade usage in the chocolate industry under the trade descriptions of chocolate couverture, bakers' covering compounds, unsweetened chocolate, neat-work, chocolate vermicelli, or chocolate granulettes.

*"Classified product" is one that has been classified by an appropriate authority.

"Confectionery" means chocolate and chocolate confectionery and sugar confectionery.

"Sugar confectionery" includes boiled sugar goods, toffees, panned goods, cream paste goods, liquorice, lozenges, pastilles, clear gums, medicated sugar confectionery, and any other goods which would be regarded in the confectionery industry as sugar confectionery; but does not include candy (or fairy) floss, any product specified in the First Schedule (see †), or any product not regarded in the confectionery industry as suitable for retail sale without further processing: provided that for the purpose of this definition sugar means sucrose, glucose, fructose, maltose, lactose, any starch conversion product capable of reducing Fehling's solution, and any mixture of such substances; nothing shall be deemed not to be sugar confectionery by reason only of the fact that it does not contain any particular kind of sugar.

A licence is required to manufacture confectionery, chocolate couverture, cocoa, and drinking chocolate, and there is a restriction on output. Maximum prices are laid down for confectionery and chocolate couverture.

All classified products must be clearly marked, and no mixing with other confectionery or other article or alteration in composition is permitted.

Products† which are not within the meaning of "confectionery" are those

(*a*) which comply with a formula in the British Pharmacopoeia, the British Pharmaceutical Codex, the National Formulary, or recognised hospital formularies or pharmacopoeias; or

(*b*) the manufacturer of which has been authorised to manufacture and sell the same free from all the provisions of this Order; or

(*c*) consisting of compressed tablets of which each tablet contains one or more of the following ingredients in not less a quantity than that specified:

(i) Phenolphthalein—$\frac{1}{8}$ grain.
(ii) Santonin—1/10 grain.
(iii) Calomel—1/10 grain.

Under the Food Rationing (General Provisions) Order (S.I. 1951 No. 854) and the Rationing (Personal Points) Order (S.I. 1951 No. 858), sugar confectionery, chocolate, and chocolate confectionery may only be supplied or obtained against the surrender of "personal points."

The provisions of these Orders are relaxed, however, in the case of sub-standard material, trade samples, barley sugar, and also sugar confectionery for re-manufacture.

COFFEE

(S.I. 1951 No. 860)

"Coffee" includes coffee mixture (unless where the context otherwise requires) but does not include any essence or extract of coffee, or of coffee and chicory, or any preparation of coffee and milk.

"Coffee mixture" means any mixture containing coffee which is commonly sold under the name of coffee or of coffee and chicory mixture.

Maximum prices are fixed for roast and raw coffee, and the retailer may sell at certain higher prices provided he is also able and willing to sell other coffee at the lower maximum prices.

The higher priced coffee must be packed in containers of a specified nature and size.

Coffee mixtures must contain not less than 51 per cent. by weight pure coffee.

CREAM

(S.I. 1951 No. 1160)

"Cream" means cream produced from cows' milk and includes sterilised cream (commonly known as "tinned cream").

"Clotted cream" means cream containing at least 48 per cent. by weight of milk fat and produced and separated by the scalding, cooling, and skimming of cows' milk or cream.

A licence is required to manufacture or supply cream or, if it contains cream, any cream cheese or ice cream. Further, no person shall obtain any cream except from one holding a licence granted to manufacture or supply.

A licence is not necessary to manufacture cream for consumption in one's own home, for conversion into butter, or for supplying clotted cream as part of a meal in catering establishments in Cornwall, Devon, Dorset, Gloucester, Somerset, and Wiltshire.

A maximum price of 6s. 6d. per lb. has been fixed for clotted cream, except in catering establishments in the counties mentioned above.

DRIED FRUITS

(S.I. 1951 No. 37; S.I. 1951 No. 771)

*"Dried fruit" means currants, sultanas, muscatels, dried plums or prunes, stoned or unstoned raisins, dried apples, apricots, nectarines, peaches, or pears.

The Order fixes maximum prices for dried fruit with an increase for breaking bulk and for cleaning, and a permit is required to obtain or use currants, sultanas, muscatels, and raisins for manufacturing purposes.

It is prohibited to:

(i) Mix dried fruits bearing different maximum prices.
(ii) Mix dried fruit with other substances.
(iii) Use dried fruit as an ingredient in a manufactured product except in a catering business.
(iv) Sell a manufactured product having dried fruit as an ingredient.

These prohibitions do not apply to:

(*a*) The manufacture or sale of pickles, sauces, and relishes; mincemeat; chocolate and sugar confectionery ("classified products"); medicines and pharmaceutical preparations; bread, buns, puddings, cake and flour confectionery, biscuits, and similar products;

strained baby foods; jam; vegetarian products; and British wines.

(*b*) The sale of dried fruit as part of a meal served by a caterer.

Under a recent Order (S.I. 1951 No. 516) it is permitted to sell imported dry mixtures of sugar, dried fruit, and suet or equivalent fat, and any such mixtures containing peel.

EDIBLE GELATINE

(S.I. 1948 No. 2460)

*"Edible gelatine" means the clean, wholesome protein which

(*a*) is obtained by extraction from collagenous material;

(*b*) is free from objectionable taste and offensive odour when in a warm 5 per cent. aqueous solution;

(*c*) contains, when air dried, not more than 3·25 per cent. mineral matter, and not more than 1·4 p.p.m. As_2O_3, 10 p.p.m. Pb, 30 p.p.m. Cu, and 100 p.p.m. Zn.

The Order provides that only edible gelatine shall be used in the manufacture of food; blending of gelatines is permitted.

EGGS

(Great Britain) (S.I. 1950 No. 1661; S.I. 1951 No. 1075)

(Northern Ireland) (S.I. 1950 No. 1662; S.I. 1951 No. 1075)

The Orders deal with restrictions on sale, supply, use, marking, prices, categories, and supplies for hatching.

Duck eggs are no longer controlled.

EGG PRODUCTS

(S.R. & O. 1946 No. 1729; S.I. 1950 No. 1138)

"Egg products" means spray dried whole egg, flake dried whole egg, desiccated whole egg, frozen egg, sugar dried egg, spray dried yolk, granulated yolk, desiccated yolk, and dried albumen.

"Frozen egg" means frozen whole egg, frozen yolk, and frozen white of egg, provided that

(i) any such product which having been frozen is subsequently sold or supplied in a wholly or partly liquefied form; or

(ii) any such product (either frozen or wholly or partly liquefied as aforesaid) which is mixed with fresh liquid whole egg, yolk, or white of egg shall be deemed to be frozen egg.

"Sugar dried egg" means the product obtained by the spray drying of whole egg pulp and added sucrose.

*"Prepacked" means packed and described as containing twelve dried eggs in powder form.

A licence is required to trade in egg products, but the restrictions imposed do not apply to (i) certain small retailers, (ii) a manufacturer buying egg products for use in his trade, (iii) catering establishments, and (iv) ships' stores.

The following restrictions apply:

(i) Frozen egg must be sold in the unopened container in which it was bought.

(ii) Prepacked spray dried or prepacked flake dried egg must be sold in the prepacked form or unopened container in which it was bought.

(iii) Caterers may only obtain egg products (other than frozen egg), frozen white of egg, and other than prepacked egg products.

(iv) Prepacked egg products may not be used by manufacturers or for ships' stores.

(v) Prepacked egg products are for household consumption.

Maximum prices are laid down for the various types of egg products.

FLOUR

(S.I. 1951 No. 1042)

"Bread" does not include fruit loaves or bun loaves.

*"'D' flour" is flour so designated.

*"Flour" includes flour containing authorised non-wheaten ingredients, and includes semolina, other than coloured or flavoured semolina, and flour unfit for human consumption; but does not include flour derived wholly or mainly from wheat which has been malted or subjected to some special treatment.

*"Imported flour" does not include imported flour containing ingredients added after importation into the U.K.

*"'M' flour" means flour conforming to the definition of national flour except that it does not contain the maximum quantity of wheat germ that could have been included therein.

*"Millers' offals" means the by-product properly obtained and must not contain more than 4 per cent. of other vegetable substances all of which shall be substances extracted by the producer of offals from the wheat and other ingredients in cleaning, etc.

*"National flour" means flour (other than Canadian springs flour) produced in the U.K. and

(i) containing maximum quantity of wheat germ having regard to the type of mill;

(ii) containing no coarse bran;

(iii) consisting wholly of wheat flour of 81 per cent. extraction and any authorised additional ingredient.

*"'W' flour" means any flour authorised to bear this description, and any flour of the same price as national flour and in so far as it is obtained from wheat is of over 81 per cent. extraction rate.

*"Non-millable wheat" means home-grown wheat so certified.

"Per cent. extraction" means, in relation to flour obtained from any description of cereal, the percentage that the weight of the flour separated in the milling bears to the total weight of all the products obtained in the milling and all the screenings, seeds, and dust extracted from the cereal by the miller before the milling.

"Self-raising flour" means national flour, "M" flour, or imported flour to which has been added $NaHCO_3$ and one or more of the following substances only:

(i) NaCl;

(ii) any acid or acidic substance capable of releasing CO_2 in the $NaHCO_3$.

"Speciality flour" means any flour other than national flour, "M" flour, imported flour, or "D" flour.

Moisture content shall be determined by the method given in the Wheat (Examination and Analyses) Bye-laws (S.R. & O. 1939 No. 850).

Control of Production and Sales

A licence is required to produce flour, other than national flour, and special provisions are made in the case of wholemeal flour.

Flour, other than national flour, must not be wholly or partly flour of less than 81 per cent. extraction.

The only types of wheat by-product which may be produced are millers' offals, wheat germ and fine wheat feed, straight run bran, coarse bran, and fine bran. Flour must be packed according to the terms of the licence.

The terms "national wheatmeal" and "national flour"

may be applied only to national flour.

"M" flour may not be sold retail and may be used only for the production of self-raising flour or as ingredient of food other than bread.

Flour may be obtained only from a licensed source, and there are restrictions on the import and export of flour, on the weight of containers, and on weights of flour therein which may be sold.

Control of Use

The Order provides that no person shall:

(i) use any wheat product (other than flour sweepings, sack shakings, and any product of unmillable wheat) otherwise than for the production of human food;

(ii) use sack shakings and flour sweepings of any product of non-millable wheat otherwise than for animal feeding or wheat by-product.

Any wheat product may be used for the preparation of bait for destroying rats or mice, and wheat by-products may be used in bait for leather-jackets, caterpillars, slugs, or snails.

"D" flour may be authorised to be in animal feedingstuffs.

The Order also deals with maximum prices, transport, and acquisition of excessive quantities of flour.

The Ministry of Food decided in 1942 to fortify flour with calcium to make up for that rendered unavailable by the phytic acid present and to raise the calcium content of people's diet as a whole. At present, *creta praeparata* is added at the rate of 14 oz. per 280 lb. sack of flour (see "Report of the Conference on the Post-war Loaf." Cmd. 6701, H.M.S.O., 1945).

HOME CANNED FRUIT AND VEGETABLES

(S.I. 1950 No. 675)

The Order specifies the size of can to be used for canning certain fruits or vegetables. It prohibits the canning of fruit or vegetables (other than peas or beans) which were imported canned or dried or which have already been canned or dried in the U.K., but this prohibition does not apply to canned tomato purée used as an ingredient in the manufacture of other canned food.

IMPORTED CANNED FISH

(S.I. 1950 No. 584; S.I. 1951 No. 345)

The Order specifies the maximum selling price.

IMPORTED CANNED FRUIT

(S.I. 1950 No. 676; S.I. 1950 No. 2128)

A price control Order relating to certain imported canned fruit.

(To be continued)

Canned Fish Cakes

A NEW type of canned fried fish cake has been developed by the Pacific Fisheries Experimental Station. Designed to fill the need for a low-priced, ready-to-serve fish dinner, it can be a by-product of salmon canning, making possible production in high volume. The ingredients are skinless, boneless chum salmon, boiled rice, cornflour, and seasoning. The cakes are oil fried before packing (six to a 10 ounce can). The product is on the market and is enjoying promising response from the public.

The problem was to develop a fish cake suitable for canning and similar to that made domestically from salmon and potato or rice. Suitability for canning depended on the cake, after frying, being rigid enough for packing, and being able to withstand the retorting. Raw salmon and cornflour allowed good forming and setting-up of the cake on frying. Rice proved more satisfactory than potato, resulting in a product little altered by retorting. Seasoning experiments showed very high levels of spices or other seasonings were required to obtain noticeable results on the finished product.

The work was carried out in collaboration with a company engaged in packing fish cakes of another type. Many changes to their machinery were made as a result of trials in actual production. These changes were required because the new product differed from the former in ingredients, frying time and temperature, cake size, pack style, and can size. A method of cooking rice with live steam and cooling with cold water was arranged. Cooling prevented partial precooking of the batter, which interfered with cake formation and setting-up. A device was made for applying pressure to the batter at the forming dies. The dies were altered to the new cake size, allowing six cakes to be packed in a 10 ounce can with a close fit, thus improving heat transfer which was needed with a dry pack.

Later experiments were made on the use of tips and tails from chum salmon. The most successful results were obtained by passing the tips and tails through a commercial machine designed to separate skin and bone from fillets. It effects the separation by pounding the flesh through a perforated drum revolving into the hammers, the skins and bone remaining outside. The flesh thus obtained has a slightly darker colour and higher oil content than the body flesh, but is quite suitable for the product.

The Tools of the Food Chemist

(Concluded from page 320)

A simple but very useful improvement is the introduction of glass filter funnels with a true 60° cone into which an ordinary folded filter paper will really fit.

Uses of Plastics

Plastic mouldings are used to a considerable extent in the construction of some of the laboratory instruments described but other plastic possibilities, such as plastic test tube racks and filter funnel stands, do not yet appear to have been developed. Plastic weighing bottles are available and a novelty is a washbottle of deformable plastic from which a jet of wash liquor can be delivered by simple squeezing.

Plant for Fractionation of Cottonseed

RECENTLY a new process for the fractionation of cottonseed meats on a pilot plant scale has been reported. This process, termed differential settling, removes the whole pigment glands from the meats, producing oil, a pigment gland fraction, and a cottonseed meal essentially free of oil, hulls, and pigment glands. The commercial application of this process is discussed by R. M. Persell *et al.* (U.S. Dept. of Agriculture) in the *Journal of the American Oil Chemists' Society*, 1950, **28**, 10, 383-386.

A preliminary cost study was made of a combination screw press extraction-fractionation plant. For this purpose a model 200 ton/day combination screw press extraction-fractionation plant was planned. The flow diagram shown was selected as a possible industrial application.

The cottonseed is run through conventional preparation machinery operated so that half the seed is fed to the extractor as practically hull-free whole meats; the remainder of the meats is processed by continuous screw presses. The extractor is operated so that the defatted meats contain 4 to 6 per cent. oil; the remainder of the oil is recovered in the fractionation system.

The elimination of the last and most difficult phase of the extraction cycle increases the capacity of the extractor considerably over that obtained when the meats are defatted to less than 1 per cent. oil. In the fractionation system the defatted meal is further defatted to less than 1 per cent. oil and separated into a pigment gland fraction and a fine meal essentially free of oil, hulls, and pigment glands.

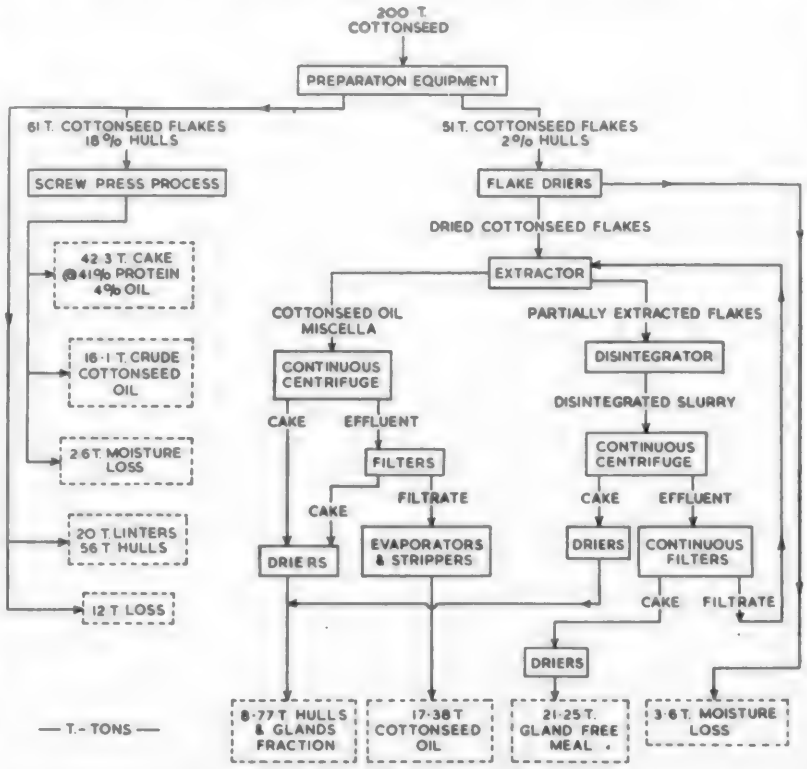
The products from the combination plant are linters and hulls from the seed preparation equipment; crude oil and meal cake from the continuous screw presses; and crude oil, purified meal, hulls, miscella cake, and pigment gland fraction from the extraction-fractionation system.

The major items of equipment for such a plant include conventional preparation equipment for 200 tons/day of cottonseed; screw presses with auxiliary equipment for 61 tons/day of cottonseed meats; a drier for 51 tons/day of cottonseed flakes; an 80 ton/day solvent-extraction unit with auxiliary equipment; a 50 h.p. dissolver-type disintegrator; a continuous horizontal 32 in. by 50 in. bowl centrifuge for separating the disintegrated slurry into an effluent containing the finer than 300 mesh meal; two pressure leaf filters for the recovery of the fine meal from 231 tons/day of effluent; and a drier for removing the solvent from 21 tons/day of purified fine meal.

The estimated original cost of this plant, including the buildings, on a 1948 cost basis was $1,328,120. The cost of converting the seed, the values of the products, and the spread between the value and the cost of the products were also calculated. A comparison of the spreads for the screw press and extraction - fractionation operations indicates that the cost of fractionation is in line with other types of processing.

The economic advantage of the combination plant over the screw press operation as shown was small in comparison with the large additional investment required for the combination plant. The authors believe that the present value of the fractionation process lies in the production of two new products, a purified high-protein meal and a concentrated pigment gland fraction, and in the possibility of producing a high grade oil, as the removal of the whole pigment gland prevents the material from coming in contact with the oil. The quantity production of the purified meal and the pigment glands is making possible the investigation of the meal and pigment glands for possible industrial and other uses.

Further pilot plant work under way indicates improvements in the process, such as a high recovery of the meal as purified fine meal. The development of additional and more profitable uses for the products would increase their value and provide a broader and more stable market for cottonseed. Such development would make fractionation a field economically advantageous.



Flow diagram of 200 ton/day combination screw press extraction-fractionation plant.

Fish Cakes and Coffee Mixtures

The Food Standards Committee have reviewed the temporary standard for fish cakes prescribed by the Food Standards (Fish Cakes) Order, 1950, and the temporary standard for coffee mixtures maintained in the Coffee Order, 1951, and, after having considered evidence from the trades concerned, have made recommendations for new standards.

THE Food Standards (Fish Cakes) Order, 1950, which provides that "not less than 35 per cent. by weight of the fish cake shall consist of fish," maintained, subject to review by the Food Standards Committee, the standards previously prescribed in the Fish Cakes (Maximum Prices) Order, 1943.

The following is a summary of evidence submitted by the National Association of Fish Cake Manufacturers and others.

Preparation of Fish Cakes

Fried fish cakes are normally prepared from cooked fish and cooked potatoes; with these two ingredients are mixed salt and other seasonings, a small quantity of fat, and a small quantity of rusk, the amount varying with the texture of the mashed potato. The mix is then moulded to shape, normally dipped in a flour and water batter and coated with bread crumbs, and fried in deep fat. Baked fish cakes, which usually include no fat, are baked and not fried and may be coated with batter; "uncooked" fish cakes are made largely by fishmongers and may be coated with bread crumbs.

A permanent standard for fish cakes was desirable, both in the interests of the manufacturer and of the public; even before the war when there was no shortage of raw materials, some traders marketed poor products. Fish cakes are prepared chiefly by small manufacturers working by rule of thumb and any standard should be simple and easy to observe.

It was generally agreed that the present minimum fish content of 35 per cent. should be increased, but the views of the trade were divided as to whether the fish content should be increased to 40 per cent. or 45 per cent. The fish content should be expressed in terms of raw fish in the mix; it is not possible to give a definite figure for yield of cooked fish from raw fish as different manufacturers adopt different cooking procedures. At certain times it may be necessary to use salt and pickled fish, and the standard should allow the use of fresh, frozen, salted, pickled, or otherwise processed fish.

Manufacturers of fried fish cakes favoured a minimum fat content of 4 per cent., but this was opposed by manufacturers of baked and uncooked fish cakes. It was generally agreed that there was no need to define the ingredients other than fish or to prescribe individual limits to the amount of any such ingredients.

Conclusions of the Committee

The Committee considered that it would be desirable to maintain a minimum standard to ensure the nutritive value of the product. The standard should apply to fish cakes whether fried, baked, or uncooked, and to similar products such as fish slabs and fish loaves.

In view of the variety of products to be covered, the Committee propose that fish cakes should be defined as "The product made from fish which has been suitably precooked, finely divided, and intimately mixed with an appropriate farinaceous substance, and after the addition of seasonings, including salt and spice, is moulded into a firm coherent cake which may be coated with batter and may be uncooked, fried, or baked; and includes any substantially similar product made up in the form of slabs or otherwise."

The Committee consider that the minimum fish content should be increased from 35 per cent. to 40 per cent. The fish content should be expressed in terms of raw fish in the mix excluding any batter coating; there appears no need to define the fish which may be used. The Committee do not think it necessary to prescribe a minimum fat content or to prescribe the permitted addition or limits for the farinaceous or other ingredients.

While the fish content of fish cakes cannot be determined with great accuracy, the Committee feel that chemical analysis will afford a sufficiently good measure of control to justify the formulation of a minimum standard of composition. The Committee have considered and rejected the alternative of defining fish content by reference to the minimum nitrogen content, on the grounds that there is insufficient published data on the natural variation in the nitrogen content of different types of fish, and that small manufacturers with no laboratory facilities would have no knowledge of the nitrogen content of the actual fish used. The Committee, however, propose to keep this problem under review.

It was suggested by certain representatives of the trade that fried, baked, and uncooked cakes should, where they are prepacked, be distinctively labelled as such. The Committee are satisfied that the three types are sufficiently distinguishable to prevent the purchaser being misled, and do not consider it necessary to require labelling for this purpose or with a view to disclosure of ingredients.

They consider that the standard should apply equally to fish cakes sold by catering establishments.

Recommended Standard

The Committee recommend that the following standard for fish cakes should be maintained:

(*a*) Fish cakes should be defined as "The product made from fish which has been suitably precooked, finely

divided, and intimately mixed with an appropriate farinaceous substance and after the addition of seasonings, including salt and spice, is moulded into a firm coherent cake which may be coated with batter and may be uncooked, fried, or baked; and includes any substantially similar product made up in the form of slabs or otherwise."

(*b*) Fish cakes should contain not less than 40 per cent. by weight of fish expressed in terms of raw fish in the mix excluding any batter coating.

Coffee Mixtures

The Coffee Order, 1951, provides that coffee mixtures shall contain at least 51 per cent. by weight of pure coffee; "coffee mixture" is defined as "any mixture containing coffee which is commonly sold under the name of coffee or of coffee and chicory mixture."

Evidence of the Trade

The following is a summary of evidence received from the coffee trade (packers and first hand distributors) and the distributive trade.

Before the war there was a wide range of coffee and chicory mixtures on the market to suit the taste and pocket of the consumer, varying from pure coffee with a small quantity of chicory to mixtures consisting mainly of chicory; the two most popular mixtures sold by one national distributor contained 40 per cent. and 35 per cent. of coffee respectively. In the early part of the war a minimum coffee content of 66⅔ per cent. was prescribed because of the shortage of chicory, but with chicory in easier supply this was subsequently reduced to the 51 per cent. coffee content still in operation.

Both the coffee trade and the retail trade (the views of the wholesale trade are divided on this issue) were of the opinion that consumer habits had changed since before the war and that there appeared to be an increasing demand for a beverage containing a higher proportion of coffee. Thus, the principal lines of four representative manufacturers contained 75 per cent., 67 per cent., 55 per cent., and 52 per cent. coffee respectively with a weighted average of 64 per cent. coffee. They doubted whether there would be a demand for a lower grade mixture now, but saw no objection to the marketing of such mixtures, provided they were distinctively labelled.

A suggestion, which was supported by several sections of the retail trade, that the minimum coffee content should be increased from 51 per cent. to 55 per cent., particularly as most mixtures now contained at least 55 per cent. coffee, was deprecated by the coffee trade, who pointed out that the 55 per cent. content provided the necessary manufacturing margin to cover the minimum 51 per cent. If the minimum were increased to 55 per cent., they would have to work to a coffee content of about 60 per cent., which would necessitate an increase in price, although a small increase of this nature in the coffee content would not be detected even by the palate of an expert.

There was no evidence of the use of ingredients other than coffee and chicory in these mixtures. The trade, however, saw no objection to the use of other ingredients in addition to coffee and chicory if there was a public demand for these products, provided the ingredients were disclosed on the label.

The description "coffee and chicory mixture" was now generally accepted as the proper description for these products and the trade favoured this description. They saw, however, no objection to the continued use of the description "French Coffee" provided it was followed by the description "coffee and chicory mixture."

Other Coffee Mixtures

There was no evidence of the sale of mixtures other than those containing chicory apart from relatively small quantities of a product containing figs and sold as "Viennese Coffee." The trade generally saw no objection to the marketing of such products if there was a public demand for them, or to the use of the description Viennese Coffee provided the ingredients were disclosed.

Viennese Coffee normally contains 5-10 per cent. of figs, and the quality has been maintained rigidly in Great Britain. The Committee were told by the U.K. manufacturers that elsewhere the quality had deteriorated and that, for example, the original manufacturers in Vienna were now marketing products comprising one-third coffee, one-third figs, and one-third roasted barley, and products of even lower quality. The U.K. manufacturers suggest that, by skill in roasting the various ingredients, the public could be deceived into the belief that the product had a high coffee content; they, therefore, favour a standard for Viennese Coffee which they suggest should require a minimum of 85 per cent. coffee to provide the necessary manufacturing margin.

New Standard Difficulties

The Committee are of the opinion that coffee and chicory mixtures lend themselves to debasement by the inclusion of excessive amounts of chicory, and consider that, particularly with the large price differential (the average price of coffee is at present about three times that of chicory), there is a good case for protecting the consumer by laying down a definite standard and/or by some special labelling requirements so that the consumer will not be misled.

In the absence of up-to-date knowledge of consumer demand in a free market, it is not easy to suggest a permanent standard or standards. The Committee would not wish to restrict unduly the types of mixture for which there might be a demand by too rigid a standard; on the other hand, if the standard is too wide it loses much of its merit. In the circumstances, the Committee were much attracted to a proposal that, instead of prescribing a definite minimum coffee content, it should be obligatory to disclose the minimum coffee content, a device already adopted in certain Commonwealth countries; the disclosure of the coffee content in this way would show the consumer precisely what he was buying without restricting manufacturers in

any way. Objection was, however, raised to this proposal as any change of formula to meet changes of taste, demand, or supply inevitably meant new labels, and this problem was a very real one in the case of coffee because of the uncertain supply position. In the circumstances, the Committee feel, on balance, that at any rate for the time being it would not be reasonable to require the percentage of coffee to be declared on labels, and that instead a definite minimum content should continue to be prescribed.

The Committee consider that, while under improved supply conditions there may well be a case for increasing the present minimum content of 51 per cent., it would be premature to do so at the present time. The existing standard has stood the test of time, and the Committee are of the opinion that it would be reasonable to retain it. They feel that there is not a sufficient case for providing a separate standard for mixtures containing a lower content of coffee; any demand would probably be so small that they would advise that the consumer should make up his own mixture from coffee and chicory which he could buy separately. The Committee are satisfied that the standard is capable of enforcement by chemical analysis without difficulty.

The Committee see no grounds for allowing the use of other ingredients in addition to the coffee and chicory. They consider that the mixtures should be described as coffee and chicory mixtures, but see no objection to the continued use of the term French Coffee, provided this is followed by the description "coffee and chicory mixture" in not less prominent characters. The Committee deprecate the use of any other descriptions.

The Committee were impressed by the arguments brought forward by the manufacturers of Viennese Coffee in favour of a standard, and consider that, although there is a relatively small demand for this product, they would be justified in recommending a standard which they suggest should require a minimum coffee content of 85 per cent. They see no objection to the continued use of the term Viennese Coffee provided this is followed by the description "coffee and fig mixture." There appears to be no demand for mixtures other than coffee and chicory mixtures and Viennese Coffee.

(*Concluded at bottom of next columns*)

Recommendations of the Committee

The Committee recommend that the following standards should be prescribed for coffee mixtures:

(*a*) Coffee and chicory mixture shall be any mixture comprising coffee and chicory but no other ingredients and shall contain not less than 51 per cent. by weight of coffee.

(*b*) Coffee and fig mixture shall be any mixture comprising coffee and figs but no other ingredients and shall contain not less than 85 per cent. by weight of coffee.

Animal Feeding

IN HIS capacity as Senior Lecturer in Agricultural Chemistry at the University College of Wales, Aberystwyth, Dr. W. M. Ashton has been faced with the problem of teaching the principles of animal nutrition to undergraduate students. Experience has taught him that most existing textbooks on the subject are too advanced for adequate digestion by readers whose knowledge of chemistry has reached only the Intermediate B.Sc. standard, and he has therefore undertaken in his textbook* the difficult task of blending a smattering of general biochemistry with an introduction to the specialised intricacies of animal feeding.

According to his scheme the student is first given information on the chemistry and biochemistry of the fats and oils, carbohydrates, proteins, minerals, and vitamins in preliminary chapters which refer only incidentally to the role of these nutrients in feeding animals. Two chapters on digestion follow, and then several on the general principles of animal nutrition, which cover topics such as types of succulent, dry, and concentrated foodstuffs, feeding standards with special reference to "starch equivalents," and rationing for maintenance and production.

The individual requirements of beef cattle, dairy cows, sheep, horses, pigs, and poultry are then outlined and discussed, with due consideration to the special needs in the various phases of growth and reproduction. Recommendations for further reading are given in three short bibliographies which cover the subjects of biochemistry, foodstuffs, and animal nutrition. The book continues with an appendix on the composition of foodstuffs, based on information supplied by the Ministry of Agriculture and Fisheries, and concludes with an adequate index.

On the whole Dr. Ashton is to be congratulated on achieving his aim of giving a concise account of the basic principle underlying the feeding of farm animals in a volume moderate in size and suitable for students. In future editions, which will doubtless be necessary to keep abreast with all developments, the central theme of animal nutrition might possibly be more strongly emphasised in the opening chapters. More information might be given, for example, on the effects of vitamin deficiencies as seen in animals in the field, and less on deficiency diseases in humans.

Mention should be made of vitamin B_{12}, which has definite applications in poultry feeding, while vitamin C, which all farm animals can synthesise for themselves, might well be dismissed in a few lines. The statement that colostrum is the ideal food for newly born calves might be amplified by comments on the relative importance of the vitamins and antibodies which it contains, as well as the inclusion of more information on the dietary requirements of young calves. Such additions, however, might be considered by the author to go beyond the modest limits of an elementary textbook; on such matters he himself is best qualified to judge.—T. M.

* *Elements of Animal Nutrition.* By W. M. Ashton, B.Sc., Ph.D., A.R.I.C. Pp. xi+208. Charles Griffin and Co., London. Price 20s.

Ministry of Food

LATEST STATUTORY INSTRUMENTS

The list given below is the continuation of the list of Instruments published in "Food Manufacture," May 1, 1951, page 186.

No.	*Date 1951*	
		PRICE FIXATION
607	Apr. 15.	The Biscuits (Prices) Order, 1951. Revokes S.R. & O. 1943, No. 1771; S.R. & O. 1946, No. 1477; S.I. 1949, No. 1512; S.I. 1950, No. 129.
727	,, 30.	Order amending the Tea (Prices) Order, 1948.
739	May 1.	The Milk (Control and Maximum Prices) (Northern Ireland) Order, 1951. Revokes S.R. & O. 1945, No. 411; S.R. & O. 1946, No. 1148; S.R. & O. 1947, No. 1222.
801	,, 10.	The Butter Order, 1951. Revokes S.R. & O. 1947, Nos. 551 and 1973; S.I. 1949, No. 878; S.I. 1950, Nos. 588 and 1429.
860	,, 22.	The Coffee Order, 1951. Revokes S.R. & O. 1946, No. 132; S.I. 1950, No. 1431.
874	,, 20.	Order amending the Sugar (Control and Maximum Prices) Order, 1947.
961	June 3.	Order amending the Feedingstuffs (Prices) Order, 1951.
978	,, 8.	Order amending the Table Jellies (Maximum Prices) Order, 1946. Revokes S.I. 1948, No. 1018.
1029	,, 14.	Order amending the Meat Products and Canned Meat (Control and Maximum Prices) Order, 1948.
		BISCUITS
606	Apr. 15.	The Biscuits (Licensing) Order, 1951. Revokes S.R. & O. 1943, No. 1253; S.I. 1948, No. 2612; S.I. 1950, No. 129.
		BREAD
592	Apr. 8.	Order amending the Bread Order, 1951.
1077	June 24.	Order amending the Bread Order, 1951.
		CEREAL FILLERS
580	Apr. 8.	Order amending the Cereal Fillers Order, 1951.
		CHEESE
728	May 1.	Order amending the Cheese Order, 1950.
		CONDENSED MILK
1009	July 1.	The Condensed Milk Order, 1951. Revokes S.R. and O. 1943, No. 1396; 1945, No. 196; S.I. 1949, No. 1028.
		CREAM
593	Apr. 30.	Order revoking the Cream Order, 1950.
668	,, 30.	The Food Standards (Cream) Order, 1951.
714	,, 27.	Order amending the Cream (Revocation) Order, 1951.
		DRIED EGG
928	June 1.	Order revoking the Dried Egg (Control of Use) Order, 1945.
		EGGS
845	May 17.	Order amending the Eggs (Great Britain) Order, 1950, and the Eggs (Northern Ireland) Order, 1950.
953	May 31.	Order amending the Eggs (Great Britain) Order, 1950, and the Eggs (Northern Ireland) Order, 1950.
1075	June 21.	Order amending the Eggs (Great Britain) Order, 1950, and the Eggs (Northern Ireland) Order, 1950. Revokes S.I. 1951, No. 953.
		FEEDINGSTUFFS
745	May 1.	The Feedingstuffs (Rationing) (General Licence) Order, 1951.
		FLOUR AND FLOUR CONFECTIONERY
1042	June 13.	The Flour Order, 1951. Revokes S.R. and O. 1947, Nos. 548, 1627, and 1868; S.I. 1949, No. 1742; 1950, Nos. 126, 1003, and 1313; and 1951, No. 530.
1078	,, 24.	The Flour Confectionery Order, 1951. Revokes S.R. and O. 1946, No. 418; 1947, No. 231; S.I. 1948, No. 2612; and 1950, No. 87.
		FRUIT
771	May 6.	Order amending the Dried Fruits Order, 1951.
		GLUCOSE
873	May 20.	The Glucose Order, 1951. Revokes S.I. 1948, No. 2113; S.I. 1949, No. 2261.
		MEAT
890	May 25.	Order revoking the Imported Meat (Marking) Order, 1941.
		OILS AND FATS
783	May 6.	Order amending the Oils and Fats (No. 2) Order, 1949.
		POTATOES
711	Apr. 25.	Order amending the Ware Potatoes Order, 1950.
		RATIONING
461	Mar. 23.	Order amending the Sugar (Rationing) (No. 2) Order, 1950.
470	,, 25.	Order amending the Fats, Cheese, and Tea (Rationing) Order, 1950.
640	Apr. 12.	Order revoking the Fats, Cheese, and Tea (Rationing) (Amendment No. 2) Order, 1951.
641	,, 13.	Order amending the Fats, Cheese, and Tea (Rationing) Order, 1950.
854	May 20.	The Food Rationing (General Provisions) Order, 1951. Revokes S.I. 1950, Nos. 784, 785, 789, 790, 796, 976, 1071, 1482, 1625, 1692, 1791, 2110, and 2111; S.I. 1951, Nos. 74, 117, 159, 288, 418, 461, and 641.
855	,, 20.	The Bacon (Rationing) Order, 1951.
856	,, 20.	The Fats, Cheese, and Tea (Rationing) Order, 1951.
857	,, 20.	The Meat (Rationing) Order, 1951.
858	,, 20.	The Rationing (Personal Points) Order, 1951.
859	,, 20.	The Sugar (Rationing) Order, 1951.

News from the Industry

Institute of Physics

At the recent annual general meeting of the Institute of Physics, Prof. W. E. Curtis (Professor of Physics, King's College, University of Durham, Newcastle-upon-Tyne) was re-elected President.

Dr. J. Topping was elected a Vice-President and Mr. O. W. Humphreys and Dr. S. H. Piper were elected ordinary members of the board. The honorary treasurer, Mr. E. R. Davies, and the honorary secretary, Dr. B. P. Dudding, were re-elected. Dr. A. B. Wood and Mr. C. G. Wynne join the board as the new representatives of the Physical Society.

The board's report for 1950, which was adopted at the meeting, again records continued progress. The effect of the establishment of the graduate grade, the raising of the minimum ages, and lengthening of the periods of experience for the Fellowship and Associateship are reflected in the way the numbers in the different grades have changed compared with previous years.

The system of granting official recognition, after inspection by the Institute, to technical colleges whose standard of teaching physics is considered adequate has resulted in substantial improvements in their facilities in several cases. Thirty-three colleges have now been recognised.

Backing the Small Baker

The Birmingham and Midland Federation of Master Bakers' Associations is taking the lead in urging the Ministry of Food to give better treatment to the bread trade particularly by granting a higher subsidy.

At its June meeting, the Federation brought forward evidence that many small bakers had been forced to give up business, while others had ceased to make their own bread and were taking it from wholesale manufacturers. Others had been swallowed up into larger combines, while many had stopped making deliveries of bread.

Moving a resolution, which received overwhelming support, Mr. G. W. Roberts, President of the Dudley Association, urged "that a new rate of subsidy be included in the subsidy returns to cover bread delivered from house to house." Outlining the present anomalies, he pointed out that the Ministry takes into account costings covering three days' delivery a week only, and the profit allowed was based on these costings. Few small bakers furnish costings so that estimates were averaged on the returns of the Co-operative Societies and the large plant bakers with big turnovers.

Unanimous support was given to the Federation's recommendation that the small baker must be allowed better remuneration, and that profit margins must be made elastic to the rising cost of raw materials and of wages. There was general agreement that the industry should pay good wages to attract and keep first-rate employees.

Lt.-Col. Maurice Batchelor.

Colonel Batchelor's Recovery

Lieutenant-Colonel Maurice Batchelor, chairman of Batchelors Peas, is a patient at Ruthin Castle, a private clinic in Denbighshire, where, following a serious illness, he is undergoing treatment which includes complete rest.

He hopes to be back in harness in the late summer to continue his many activities, which include the chairmanship of the Fruit and Vegetable Canners' Association. A Justice of the Peace and President of the Sheffield Publicity Club, Colonel Batchelor works hard for ex-service and charitable causes.

Colonel Batchelor has the remarkable record of having served in all three branches of the Armed Forces. In the first world war he served in the Navy; at the outbreak of the second world war he joined the Royal Air Force; and in 1940 he was transferred to the Royal Army Ordnance Corps of the British Expeditionary Force and was mentioned in despatches. He partially recovered from wounds received at Dunkirk, and, despite disability, he became Officer in Charge of Administration at Chigwell before finally being pronounced medically unfit and discharged.

Appointments

Mr. R. H. Del Mar, M.A., F.R.I.C., managing director of Glycerine, Limited, and secretary of the United Kingdom Glycerine Producers' Association, has been appointed commercial director to Lever Brothers (S.A.) (Pty.). He will sail for South Africa in October. He is succeeded by Mr. F. W. G. Moore, A.M.I.W.M.

Mr. Del Mar joined the Unilever organisation in 1937. He is well known among food manufacturers as managing director of Advita, an appointment which he now relinquishes. From 1945-50 he was secretary to the Vitamin A Manufacturers' Panel.

Mr. B. R. Hook, former assistant to Mr. Del Mar, now becomes general manager of Advita.

*

Mr. A. J. Thompson, M.Inst.F., Assoc.M.Inst.GasE., has been appointed technical representative and engineer of The Dowson and Mason Gas Plant Co. He will be responsible for the company's activities in London and the Southern Counties.

Advertisers' Silver Jubilee

Acting as chairmen or speakers at the recent International Advertising Conference (Gt. Britain) 1951, organised by the Advertising Association of Great Britain to celebrate its silver jubilee, were Major-General Van Den Bergh, O.B.E., director of Lever Bros. and Unilever, Rotterdam; Mr. George Patterson, deputy chairman, Peek Frean (Australia); Mr. Paul Cadbury, director, Cadbury Bros.; and Mr. F. J. Adnum, advertising manager, Glaxo Laboratories (India).

Obituary

Mr. J. S. Wingate, J.P., at the age of 87.

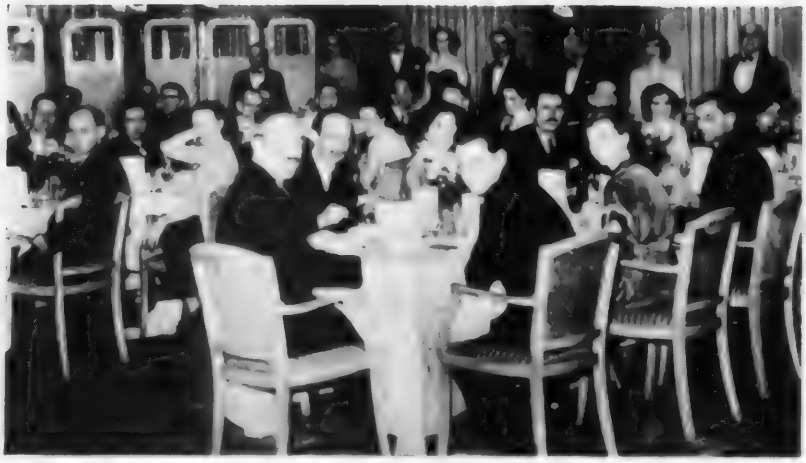
Until his retirement last April, Mr. Wingate was chairman and joint managing director of the Westburn Sugar Refining Company, Greenock, and chairman of the Glebe Sugar Refining Company, Greenock. He joined the Brewers' Sugar Company, the parent body of the Westburn Company, as bookkeeper in 1885, and was appointed chairman in 1922.

He was regarded as one of the leading members of the sugar refining industry in Scotland.

*

Mr. Clifford S. Jenks, a director of Brian, Jenks and Co., on June 1.

For many years previously Mr. Jenks was a director of Macpherson Train and Co.; he was also elected to the board of Eastern Counties Preserves (1940) last October.



The staff of Leonard Hill Ltd. welcome home their chairman.

Welcome Home

A dinner was given at the Trocadero on June 15 by the staff of Leonard Hill Ltd. to welcome home the chairman, Mr. W. Leonard Hill, and Mrs. Hill from their visit to America.

In addition to the addresses of welcome made by Mr. T. Crosbie-Walsh and Mr. C. J. Mumford, appreciations were given by Mr. K. Joslin and Mr. A. Whittick.

An interesting description of the American way of life was given by Mr. Hill, who, during the course of his speech, entertained the company by telling of some amusing personal experiences during his tour.

To conclude the proceedings, a presentation of a silver mounted onyx inkstand was made on behalf of the staff to Mr. Hill, together with a fountain pen and pencil set for Mrs. Hill, who unfortunately, owing to indisposition, was prevented from attending.

Monostearates in the Food Industry

Their ability to orient themselves at the water-oil interface so that one end of the molecule embraces, or is embraced by, the oil phase and the other by the aqueous phase makes possible the use of Crill No.. 213, glyceryl monostearate, and Crill No. 220, propylene glycol monostearate, in many diversified products.

The addition of small percentages of these glycerides greatly improves shortening oils and fats; margarine gives smoother texture because they bind the aqueous (milk) phase preventing separation and weeping during storage.

Certain water-insoluble materials, which are not readily compatible with aqueous materials, such as lecithin, are stabilised and rendered readily dispersible in aqueous media by the incorporation of varying amounts of these Crills. Their addition in small percentages to cakes, containing more sugar than flour, improves their texture and uniformity, and reduces the tendency to staleness.

In the production of casein from milk whey and yeast by fermentation an undesirable froth or foam is produced, but the introduction of small amounts of glyceryl mono- and di-laurates effectively combats this formation.

The manufacture and packaging of bakers' compressed yeast have also been improved by the use of less than ½ per cent. of esters. By proper introduction in the manufacturing process it prevents lumping of the yeast, which speeds up manufacture and gives a more uniform product. Furthermore, yeast made in this way is extruded more easily, fractures cleanly, and shows a homogeneous texture, instead of concentric circles and an uneven surface and break.

"Flying Visit"

Their Swedish distributors, A/B K. J. Levin, recently flew to England for a visit to the works of The Pressed Steel Co.

After seeing the factory, they toured the City of Oxford, and then went to London to visit the Festival of Britain. They saw a number of the numerous items of Prestcold equipment which is in use there, and the special display piece manufactured by the company which is on show in the Dome of Discovery.

With the party were two directors of I.C.A., a Swedish food distribution firm who have over 1,000 retail shops in Sweden, and a director of the important Swedish business, Ahlsell and Bernstrom.

Personalia

During his recent visit to America, Mr. W. Leonard Hill was made a member of the Harvard Club, sponsored by Dr. N. Polulin, former editor of *International Chemical Engineering*.

Good Housekeeping Campaign

With the object of seeing just what factories can do to improve their "housekeeping," a campaign on a national scale is in progress. James Keiller and Son, Dundee, are taking an active part by inviting their workers to use their initiative to improve, if possible, upon the high standard of cleanliness and tidiness already maintained in their factories. The challenge has been taken up with considerable interest and enthusiasm.

The company's recent activities have included the exchange of visits between the workers of the firm's Dundee factories, by intensive management checks to judge results, and by visits from other industrial leaders under the guidance of the general manager, Mr. C. J. Gahlinger.

Colour Identification of Pipe Lines

Of recent years considerable attention has been given to the use of colour for the identification of pipe lines, and a number of difficulties have arisen because of differing opinions as to whether the identification should be on the basis of the characteristics of the pipe content or the identification of the pipe content as such.

During the past twenty years three British Standards have been published dealing with the identification of piping, and certain anomalies have arisen. In order to remove these difficulties, and to co-ordinate requirements, a code has been prepared which replaces B.S.437, Identification of chemical pipe lines, B.S.617, Identification of pipes, conduits, ducts, and cables in buildings, and B.S.3011, Identification colours for engine room piping, but it does not supersede the British Standards dealing with gas cylinders and medical gas cylinders, neither does it affect the provisions of B.S.158, which deals with the colour identification of switchgear bus-bars and connexions and wire.

The Standard itself provides primary identification colours which indicate the class of content in pipe lines, these colours being applied along the length of the pipe or in broad rings, as desired. Detailed identification of the contents by narrow rings or letters, and for certain special conditions, are covered in the appendices.

Consideration has shown that, since only a limited range of colours is suitable for use under all conditions without confusion being caused through fading or discoloration, any highly complex scheme for identification is unlikely to be really practicable and a simpler code has been evolved.

Coloured illustrations of the application of the code are included.

Hygienic Plastic

Presenting a smooth surface which does not scratch or crack, cannot collect germs, is easily cleaned, and is heat- and stain-proof, Formica, the laminated plastic sheet produced by Thomas De La Rue and Co., combines tough durability with good looks. It is available in a wide variety of shades which will match any colour scheme, the range varying from deep cherry mahogany to pale grey and blue linette.

As well as being resistant to alcohol and all normal acids and alkalis, it is unaffected by heat up to 120° C.

The material is readily cleaned by a wipe with a damp cloth.

Seed Crushers Meet

To mark the year of the Festival of Britain, the Annual Congress of the International Association of Seed Crushers (producers of vegetable oils for edible products, such as margarine; oils for technical purposes; and oil cakes and meals for animal feedingstuffs) was held at Brighton from June 11 to 16.

Four hundred and fifty delegates and their wives, representing seed crushing, shipping, and merchanting interests from 20 different nations, attended the Congress. Apart from the business sessions, banquets were given by the National Seed Crushers' Association of Great Britain, who were the hosts at the Congress, and by the Incorporated Oil Seed Association of London. The delegates were also entertained by the Mayor and Mayoress of Brighton at a garden party at the Royal Pavilion.

Mr. Guy Chipperfield, chairman of The British Oil and Cake Mills and of the National Seed Crushers' Association of Great Britain, was unanimously elected President of the International Association in succession to Mr. J. W. Pearson, who has held that office for 30 years.

Grading of Ice Cream

At an ordinary meeting of the North of England Section of the Society of Public Analysts and Other Analytical Chemists held recently, the retiring chairman, Mr. J. G. Sherratt, delivered an address dealing with the comparison of the results of the methylene blue grading test for 1,400 samples of ice cream from various sources with the results of plate counts at 37° and 20° C. and the coliform population of the samples. It was concluded that a grade 1 indication might be accepted with confidence, and that about 80 per cent. of samples falling in grade 2 were bacteriologically satisfactory. The presumption that samples falling in grades 4 and 3 were unsatisfactory must be adopted only with considerable reserve.

Food display counter veneered in blue linette Formica in the Rocket Buffet, South Bank Exhibition.

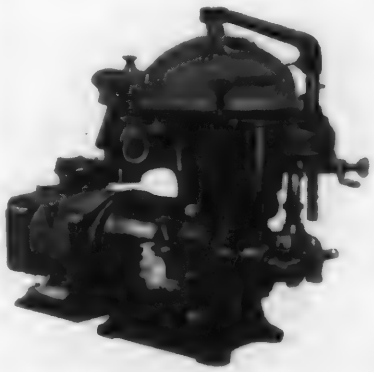
Engineering on Show

Engineer Vice-Admiral Sir Harold Brown, G.B.E., K.C.B., has accepted the position of honorary President of the Engineering, Marine, and Welding Exhibition which will be held at Olympia from August 30 to September 13, 1951.

This year the Exhibition, which has been held biennially since 1906, except for the interruptions caused by the two world wars, includes the Foundry Trades' Exhibitions.

The representative range of their machines to be shown by Alfa-Laval Company includes a centrifuge specially developed for treatment of low and high viscosity fuel oil (boiler oil) for use as a Diesel fuel. This machine has a high separating efficiency and achieves the maximum extraction of insoluble ash. It is also used as a high capacity, large sludge space machine for other general problems.

A medium capacity centrifuge with built-in motor and pumps, for general oil separation and purification, and a small oil purifier with direct electric oil heater arranged as a compact unit will also be on view.



De Laval centrifugal separator.

Other exhibits will be a special hermetic clarifier designed for the clarification of liquids with no air contact, also for clarifying liquids containing gas where no gas loss is permissible, and a general purpose continuous laboratory centrifuge for continuous and batch clarification, purification, and washing.

Instrument Maintenance Courses

Intended to meet the needs of mechanics and technicians concerned in the maintenance, repair, and installation of the instruments used for process and production control in industrial plants and in H.M. Forces, a new scheme of courses and examinations in instrument maintenance has been announced by the City and Guilds of London Institute.

The course of part-time study is of five years' duration, with an intermediate examination at the end of the third year, and a final examination at the end of the fifth year. There is provision for students holding an appropriate Ordinary National Certificate to enter the course at the beginning of the fourth year.

A pamphlet containing the regulations and syllabuses for the City and Guilds examinations is available from the City and Guilds of London Institute, Department of Technology, 31, Brechin Place, London, S.W.7.

Metal Manual

The Besco Pocket Manual of Sheet Metal Working compiled by J. W. Langton, M.B.E., B.Sc., M.I.Mech.E., and published by F. J. Edwards at 3s., is a well-printed little book. Besides describing the company's tools and machinery, it gives tables for blank determination, cutting pressures, and other technical data. Sixteen pages of squared paper are included for the convenience of users.

Emulsifying Agent for Foods

Manufactured from pure raw materials and complying with the requirements of the Food and Drugs Act, Progress Brand glyceryl monostearate is supplied by Progressive Chemicals in both block and powder form. The latter offers the advantage of quick melting and ease of incorporation into food preparations in powder form such as cake flour or ice cream powder. A free fatty acid content of not more than 3 per cent. and a monoglyceride content of 40 per cent. are guaranteed.

General directions for the use of this product are contained in a brochure recently produced by the company.

Measurement in Industry

A direct-reading indicator over the range 1 to 11 *p*H with manual temperature compensation and a glass electrode system mounted within the portable case which is manufactured by Marconi Instruments is ideal for checks in plant or laboratory to an accuracy of 0·05 *p*H. In conjunction with their laboratory or battery model *p*H meters, the company's serum electrode measures *p*H of solutions when only a very small volume is available—particularly the sera encountered in biological work. A rapid, temperature-corrected indication of the moisture content of hygroscopic materials, such as cereals, grains, or flour, can be obtained from one type of moisture meter, while a thickness meter makes a quick direct measurement of the thickness of plating, paint, or other covering deposited on a ferrous base.

The company also make an electronic counter which can be used in conjunction with an initiating element for counting or timing the number or rate of moving objects up to one million per second, or time intervals down to one microsecond; the reading appears in illuminated figures.

Emulsifiers and Ice Cream

In order to further the interests of the ice cream industry, a meeting was recently arranged by Advita at 38/39, Queen Street, London, E.C.4, where there is a fully equipped ice cream plant and laboratory. During the discussion, which preceded the tour of the plant, it was emphasised that the industry as a whole would benefit if a sound and realistic specification were established for glyceryl monostearate by a respected authority. The company also announced that they had just installed additional plant which would virtually double their original monoglyceride production, their aim being to provide cheaper and better emulsifying agents as soon as oils and fats were in free supply.

Hygienic Protective Sealing

Providing an excellent and attractive final seal, especially for food packs, the Viskring type of closure or sealing band is suitable for securing stoppered corks, screw caps, rubber caps, and the Kork-n-Seal closure.

The rings are available in two grades—transparent and opaque—and these qualities can be made in a wide range of standard colours; they can also be printed in black on suitable contrasting grounds, although black or dark coloured rings cannot be legibly printed.

The closures, which are made by Viscose Development Co., are made in sizes to fit every bottle; they are modest in price and available for early delivery.

Vertical speed reducer.

Geared Motors and Speed Reducers

A new range of geared motors and speed reducers, covering the range from $\frac{1}{10}$ to 27 h.p., with a standard minimum speed from 6 r.p.m. up to 556 r.p.m., has been introduced by Electropower Gears. A large selection of speeds in between this range is available on double and triple reductions, and these units can be offered to give variable speeds when fitted with variable speed type motors. Apart from single speed motors, two, three, or four individual speeds can be obtained by means of fitting pole change type motors. Any type or make of motor can be fitted, subject to the physical dimensions being suitable.

All gear boxes are of the spur wheel type, silent in operation, and eminently suitable for building into most types of machine tools and manufacturing plant generally.

The complete unit is manufactured at the company's Kingsbury works, and the range includes standard horizontal geared motors and gear boxes, vertical flange type geared motors and gear boxes, and single worm reduction geared motors. Some hundreds of units have already been supplied to well-known machinery manufacturers, and quite a large number of units have been exported to the Scandinavian countries, South America, Australia, South Africa, and Canada, agents having been appointed in the majority of overseas markets.

Standards for Milk Analyses

Following the recommendations of the British Commonwealth Standards Conference in 1946, a Technical Committee was set up under the authority of the Dairying Industry Standards Committee of the British Standards Institution to prepare British Standard methods of analysis for dairy products. Three of these standards have now been published.

B.S.1741 : 1951, relating to liquid milk, gives a method for the preparation of the sample, as well as methods for determining total solids, fat, ash, nitrogen (protein), and titratable acidity, and for the detection of hypochlorite.

The problem of standardising methods of analysis for condensed milk has been the subject of many investigations, notably by the Milk Products Sub-Committee to the Standing Committee on Uniformity of Analytical Methods of the Society of Public Analysts and Other Analytical Chemists.

The *Fédération Internationale de Laiterie* at a Conference held in 1934 adopted the methods given in the reports, and these have therefore been embodied in the new British Standard, B.S.1742 : 1951.

Methods for the examination of sweetened condensed and evaporated milk, the composition of which has altered by keeping, have not been included as it was felt that these were not of general interest to the industry.

The standard provides a method for preparing the sample, as well as methods covering the determination of total solids, total milk solids in sweetened condensed milk, fat, ash, nitrogen (protein), and sucrose.

B.S.1743 : 1951, relating to dried milk, contains a method for the preparation of the sample as well as methods for determining moisture and total solids, fat, nitrogen (protein), ash, alkalinity of ash, titratable acidity, bulk density, and sediment.

Methods for the determination of solubility index were considered but were not regarded as having been sufficiently finalised for inclusion in a British Standard at the present time.

Erections and Extensions

Extension of their factory premises at Victoria Road, Chelmsford, Essex, is planned by British Vitamin Products.

*

The erection of a new depot and offices at West Bay Road, Southampton, is planned by Rowntree and Co.

Chemical and Industrial Glassware

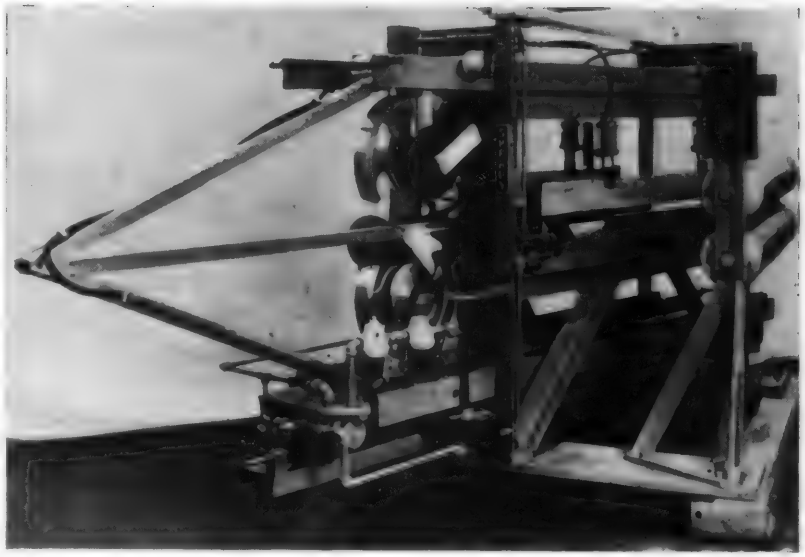
Among the exhibits in the chemical glassware section of the exhibition of the British Standards Institution at the Science Museum, South Kensington, is a stand mounted by Quickfit and Quartz, whose display includes standard reaction or vacuum distillation vessels, both a plant scale flask (200 litres capacity) and a laboratory scale flask (2 litres capacity); standard fractionating or scrubbing column units with Raschig ring packing; and a model of a glass plant for production of pure sulphuric acid.

Conservation of Scarce Materials

Scarce materials and their effective use are basic to the growing defence programme and to the further raising of productivity in Great Britain. The Anglo-American Council on Productivity therefore sent recently a special mission to the United States to explore the subject with the engineering and allied industries with a view to making suggestions as to how British industry can improve its industrial housekeeping and use scarce materials in the strictest possible way.

The group was a small and specially selected one chosen in consultation with a number of the principal trade associations and the Trades Union Congress. The following were the terms of reference: "This specialist group is to enquire into measures being taken and planned in the engineering and allied industries in the United States for the conservation and efficient utilisation of scarce materials. It is concerned primarily with the immediate short-term problem but would wish also to be put in touch with any long-term steps (involving basic changes in design) being currently planned. The following headings are suggested for the enquiry in addition to any others which may be proposed by the U.S. side:

1. Scarce materials substitution.
2. Emergency specifications and standards.
3. Direct economy measures.
4. Short-term alterations in design.
5. Simplification of product range to eliminate items using high proportions of scarce materials.
6. Factory re-organisation to ensure economy.
7. Possibilities of increasing co-operation between materials supplier and user."



The automatic butt splicer for web-fed paperboard presses.

Butt Splicer and Re-winder

Two new machines of interest to the packaging industry have been announced by the Ford Instrument Division of the Sperry Corporation of New York, whose English agents are Industrial Products (Speco). One, a butt splicer for use with web-fed paperboard machines, joins old roll and new in an operation that takes barely one second. The two ends are clamped, sheared, pressed to a common level, and sealed with standard two-inch pressure-sensitive masking tape on both sides, top, and bottom.

The machine is available in two sizes measuring 28 in. and 42 in. respectively. When set for making splices at angles smaller than the standard 20° from the square, both machines can handle slightly wider webs.

The re-winder, specially designed for use with materials—notably Cellophane, paper, heavy board stocks, and the lighter gauges of sheet metals—which must be re-rolled under controlled tension, combines high-speed running with complete freedom from oscillation.

The machine is highly sensitive to random fluctuations in web tension and quick to make corrective responses. In consequence, the rolls (which may be up to 44 in. in diameter) are uniform in density, free from the danger of telescoping, and easy to bring under register control. If a web should break during re-wind, interlocks prevent a runaway and ensure easy re-starting.

Dundee Developments

Developments noted at the "Made in Dundee" Exhibition included two new lines by Smedley's—a tomato ketchup and a stoned whole cherry conserve.

U.S. Market Data

Reports compiled by the Commercial Department, British Embassy, Washington, on the market in the U.S.A. for pickles and sauces, and for jams, jellies, marmalades, preserves, and fruit butters, give some interesting data for the manufacturer wishing to enter the American market.

Advice on advertising, sales promotion, and merchandising, statistics on U.S. production, exports, and imports of these commodities, and details of prices are given; it is emphasised that U.K. manufacturers should be able to supply their market adequately and without delays.

Economiser Condensers

Combining, in a compact, self-contained unit, a forced draught cooling tower and an evaporative condenser, using most efficiently the latent heat of vaporisation of water and the cooling effect of air, the economiser condenser made by G. and J. Weir can achieve a great saving of water when installed in a refrigeration system.

The water spray arrangement provides correct and even flow of water over the condenser coils. The water tank is provided with a float operated ball valve to maintain the water level in the tank by making up water lost through evaporation. Provision is made for a small quantity of water from the coils to be bled off automatically, thereby keeping the concentration of salts in the water tank and the possible accumulation of solids in the sump at a safe value. Large inspection doors are provided in the condenser casing to allow access to the ball valve and for cleaning the sump tank when necessary.

Laboratory and Industrial Glassware

In addition to the many standard articles of laboratory glassware such as beakers and flasks, James A. Jobling and Co. are manufacturing all types of special apparatus to meet individual requirements for laboratories or industrial use.

On the industrial side, Pyrex brand glassware is utilised for such plants as heat exchange units and cooling condensers, and complete installations of pipe lines are being set up in many industries including the chemical, soft drinks, and dairy industries.

Booklets Received

In daily use for the manufacture of such products as alkyd resins, varnishes, and dehydrated castor oil, the Kestner Isolectric plants enable economic use of electric power, ensure better quality products, reduce running expenses, labour demands, and upkeep costs, and eliminate fire and accident risk.

The plants are described in detail in a new brochure issued by the company.

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Intended as a guide to commercial and technical departments handling their brand of alginates, the catalogue produced by Alginate Industries describes in two sections their physical and chemical properties and method of manipulation, and their particular use in each individual trade.

Leaflets dealing with the principal food uses of alginates with typical formulae, the special field for alginates in conjunction with cold milk, the use of Manucet in the manufacture of jellies for the confectionery and bakery trades, and the applications of Manucol in the preparation of meat-packing jellies and for stabilising and extending whipping creams, etc., are also available.

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A description of the use of their products in the ice cream and bakery industries is contained in a handy booklet published by the Spicer Food Co.

Glyceryl monostearate is marketed in pure white block form or as an air-floated powder and is of identical quality, but because of its more convenient form the powder is almost exclusively demanded by the ice cream industry.

The company's stabiliser "B" ensures the maximum overrun and prevents the ice cream from melting down into liquid too readily. It can also be used in the production of water lollies.

Superglycerated fats have also been developed by the company with a view to raising the highly organised production of bread to achieve a higher standard of keeping quality and appearance

OBITER DICTA

• Brewery dividends are a matter for the Chancellor. Why not develop co-operative breweries and beat the brewers at their own game?—*Mr. Maurice Webb.*

• We have traditionally been the worst-fed nation in the world—with the exception of the Welsh, whose thoughts are set on higher things.—*Prof. Joad.*

• I know of a cook whose way of timing the boiling of eggs was to sing the hymn "Rock of Ages"—three verses for soft-boiled, five for hard.—*Dr. Cyril Garbett, the Archbishop of York.*

• A juicy steak for supper is a greater inducement to work than money which cannot buy one.—*Mr. F. Brian Smith, President of the National Federation of Grocers' and Provision Dealers' Associations.*

• There's nothing funny about fish and chips, as anyone who has to eat out in cafés will confirm. You can't be too serious these days about anything as inevitable as chips.—"*South Wales Echo and Evening Express.*"

• The only time the housewife has a chance of getting a smell of tongue is either in a café or at a wedding reception.—*Councillor A. H. Bentley at a meeting of Derby Food Control Committee.*

• Seal meat may be roasted, casseroled, boiled, and, best of all, cut into steaks and fried. If only housewives can be induced to try seal steaks, I am sure they will come back for more.—*Flt.-Lt. Francis Leatherdale.*

• I don't know whether the men have noticed it like the women, but immediately the meat ration is reduced the price of fish goes sky-high.—*Mrs. E. Wood of Manchester at the conference of the National Union of General and Municipal Workers.*

• We once had visitors round when there happened to be no chicken in the factory. They mentioned their views had been confirmed that we never used chicken. Quite a scene, and to save similar occurrences, we started saving our wishbones.—*Mr. Charles E. Shippam, managing director of the Chichester meat and fish paste firm.*

A revised version of a pre-war booklet, *Cold Cookery*, recently published by the British Electrical Development Association, contains instructions for getting the best service from the refrigerator.

▪

A series of monographs on malt and malt products is to be published by Muntona (associated with Edward Fison) to mark the past century's progress. The first of these, dealing with malt amylases and their action on starch, has now been issued and will be followed by others devoted to the use of malt and its products in the food, beverage, and chemical industries.

Company News

At a recent board meeting of L. Rose and Co., the directors declared a dividend on the preference shares of the company for the six months ending June 30, 1951, at the rate of 6 per cent. per annum, less income tax.

The directors also declared a dividend on the preferred ordinary shares of the company for the six months ending July 31, 1951, at the rate of 8 per cent. per annum, less income tax.

▪

A net profit for the year ended March 31, 1951, after providing for all charges, of £610,262, compared with £578,063 for last year, was mentioned by the directors of J. Lyons and Co. in their fifty-seventh annual report to the members.

The directors recommended a final dividend of 3s. 6d. per £1 unit (making 4s. 6d. per £1 unit for the year) on the ordinary stock and on such of the "A" ordinary stock as was already issued at January 1, 1951, and a final dividend of 8s. 4d. per £1 unit or share respectively on the proportional profit stock and "B" proportional profit shares (making 10s. 8d. per unit or share for the year).

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The progress made by the company was illustrated by Mr. J. B. Dring, chairman, at the nineteenth annual general meeting of United Canners, when he compared its present position with that at the end of 1947.

At the moment the canning industry, he said, was handicapped by an insufficient supply of cans; consequently there was an artificially created shortage of canned English fruits and vegetables. This had resulted in suspending operations in three of their canneries, and he suggested that the position of tinplate exports required re-examination.

It was proposed that there should be a dividend of 20 per cent., less income tax, which, together with the interim dividend of 10 per cent. already paid, made a total of 30 per cent. for the year.

World Food News

Appointments

Chemicolloid Laboratories, Inc., have announced that Dr. C. Olin Ball is associated with them as consultant for food research and Mr. Alfred J. Finberg has been appointed technical director of food research in connexion with the Charlotte continuous mayonnaise machine and the Charlotte colloid mill.

Tanganyika's Oil Refining Plant

The foundation stone of the buildings for a new plant of Victoria Oil Mills in Mwanza, Tanganyika, was recently laid by His Excellency the Acting Governor, E. R. E. Surridge.

The new factory will not only stimulate cottonseed production, but will also provide a welcome source of edible oils. Supplied by Bamag of London, the factory will represent the latest in cottonseed oil refining technique, and will include the new high-vacuum, non-drip deodoriser, which needs less steam and cooling water than other types.

OVERSEAS ENQUIRIES

Jams and Pickles

The United Kingdom Trade Commissioner for the Maritime Provinces and Newfoundland at Montreal has reported that Pratt Representatives (Newfoundland), Steers Building, 379, Water Street, St. John's, Newfoundland, desire to obtain the representation of United Kingdom manufacturers of jams and pickles in the Province of Newfoundland.

Firms interested in this enquiry should forward full details including quotations in dollars, c.i.f., and terms of business, direct to the company.

*

Deep Freeze Cabinets

It is reported that Spinney's (1948), of Beirut, Lebanon, are interested in contacting United Kingdom manufacturers of deep freeze cabinets.

United Kingdom firms who are interested in this enquiry should communicate direct with the Lebanon firm at P.O. Box 746, Bab Edriss, Beirut, enclosing details of their latest types of deep freeze cabinet.

*

Packaged Tea

The British Consulate General at Houston, Texas, has advised that the European Import Co., 910, Preston Avenue, Houston, wish to receive offers from United Kingdom suppliers of tea who are not already represented in the United States. They are interested only in tea in ¼ lb. and ½ lb. consumer packages—not in bulk.

United Kingdom firms interested in this enquiry should communicate direct with the European Import Co., quoting in dollars c.i.f. Houston, and sending samples if possible. Correspondence should be marked for the attention of Mr. Antone.

*

Complete Cold Storage Plant

The United Kingdom Trade Commissioner at Lahore reports that Syed Bhais, 26, The Mall, Lahore, desire to be put in touch with United Kingdom manufacturers of a complete cold storage plant.

The company propose to erect a cold storage plant, required mainly for their own use. They invite c.i.f. quotations for a 20 ton plant direct from manufacturers; payment for any plant ordered would be effected by Irrevocable Letter of Credit.

Interested United Kingdom firms are invited to communicate direct.

Further information can be obtained from the Special Register Information Service of the Board of Trade, Thames House North, Millbank, London, S.W.1.

New pH Standards in U.S.A.

Four new *p*H standards, intended to provide fixed points at the upper and lower ends of a standard *p*H scale, have recently been selected by chemists of the U.S. National Bureau of Standards. The Bureau has long recognised the need of a universally accepted scale of acidity, analogous to the International Temperature Scale. To encourage the adoption of such a scale, the Bureau has, for several years, distributed three standard samples of known *p*H in the United States and abroad. These samples fix the scale at *p*H 4, 7, and 9, and the *p*H of intermediate points is obtained by interpolation. Unfortunately, this scale is not uniform at its ends, and additional standards are needed to reduce the error of measurement at low and high *p*H.

In a recent study, R. G. Bates, Gladys G. Pinching, and E. R. Smith, of the Bureau's physical chemistry laboratory, determined the extent of inaccuracy at the ends of the practical *p*H scale. They concluded that an instrument calibrated with the present solutions of intermediate acidity will usually yield results that are low by 0·02 to 0·05 unit or more above *p*H 11. Below *p*H 2·5, errors as great as 0·03 unit, either positive or negative, were found. In general, solutions of strong acids and bases display larger errors than buffered solutions.

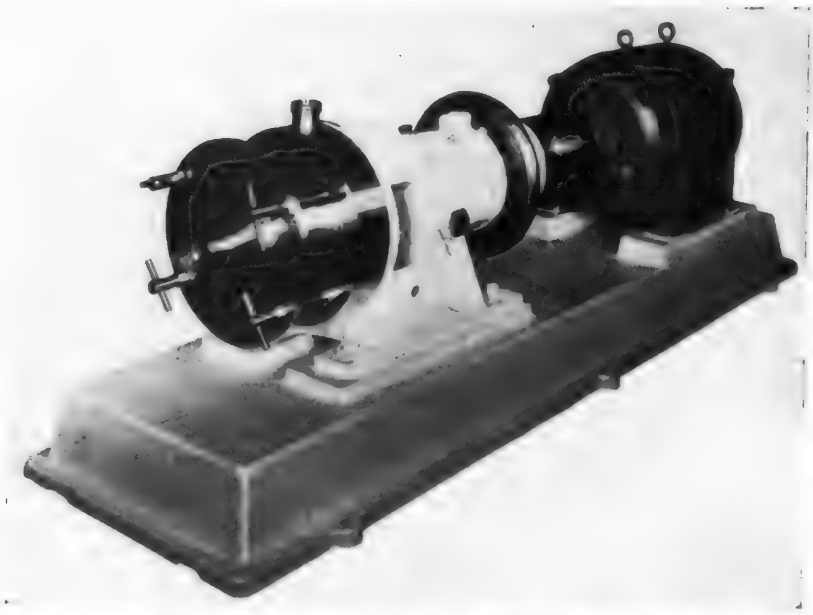
In the course of the work 41 solutions of possible value were examined. Out of these, the following four standards were selected:

1. A mixture of sodium bicarbonate and sodium carbonate, both at 0·025 molar concentration, with a *p*H of about 10 at room temperature.
2. A 0·01 molar solution of trisodium phosphate, *p*H about 11·7.
3. A solution of potassium hydrogen tartrate saturated at room temperature, *p*H about 3·6.
4. A 0·01 molar solution of potassium tetroxalate, *p*H about 2·1.

Although the new standards lengthen the accurate portion of the scale in both directions, the measured *p*H of highly acid and highly alkaline solutions must still be assigned an uncertainty of at least ±0·03 unit.

The Bureau plans to add the potassium hydrogen tartrate and the potassium tetroxalate to the standard samples it issues when an adequate supply of the purified materials has been obtained, tested, and bottled for distribution.

Equipment for the accurate determination of the pH of solutions.



Colloid mill for use in connexion with immiscible liquids, liquids carrying solids in suspension, and pastes.

High Speed Colloid Mill

Essentially a high speed disintegrator and emulsifier, in which immiscible liquids, liquids carrying solids in suspension, and pastes, are finely dispersed, disintegrated, and homogenised, the Charlotte colloid mill consists of a grooved conical rotor which rotates within a correspondingly grooved conical stator, the clearance between them being regulated by a calibrated external adjustment device.

The materials to be dispersed, disintegrated, or homogenised are fed into the inlet of the mill by gravity and are forced into the gap between the rotor and stator.

The high speed at which the mill rotates ensures that the materials are effectively dispersed and thoroughly blended.

Its use makes possible a new system of continuous production and assures uniformity of product, better plant control, and considerable saving in floor space by the elimination of bulky equipment.

Transparent Wrap for Margarine

Margarine in transparent wrappings is being distributed nationally in America by Swift and Company, producers of Allsweet margarine.

The new pack consists of four parchment wrapped ¼ lb. blocks of margarine, tightly overwrapped with Cellophane. Attractively printed in bright yellow, blue, and red, the wrapper is so designed that the label encircles the package like a band, leaving both ends of the four blocks plainly visible through the transparent surface.

The wrap stands up well to normal distribution conditions, including summer temperatures in the south. Since there is no grease absorption by the Cellophane overwrap, the package remains unstained and does not tend to pick up soilage. In tests, the package has withstood the weight of a man without rupturing, and keeping qualities of the product are enhanced by the fact that the outer wrap, with its heat-sealed seams, is practically air-tight.

Irish Milling and Baking Industry

Irish baking firms have been emphasising the need for the importation of bigger supplies of strong wheat, a substantial proportion of which must be mixed with Irish wheat to produce a flour suitable for the manufacture of good quality bread and cakes. Supplies have been insufficient for some time. Last year's Irish wheat harvest, although affected by bad weather conditions, was reaped in good quantities and the quality proved to be better than expected.

The demand for unsubsidised mill products like maize meal, animal mashes, and poultry feed has increased, and many firms are now finding it difficult to obtain sufficient suitable raw materials to meet customers' requirements.

Speaking of the Flour and Bread Enquiry Report issued some months ago, Mr. Edgar Anderson, M.A., B.A.I., chairman of Johnston, Mooney, and O'Brien, has stated that the report shows that the baking industry is not making a reasonable profit under present controlled bread prices and he called for rectifying action on the part of the Irish Government.

The report is an informative survey covering every branch of the milling and baking industry. Already some of the recommendations made by the Committee who compiled the report have been adopted by the Government, and others have been rejected; among the remainder under consideration are many which the industry considers would have serious consequences if implemented. It has also been pointed out that the report clearly shows that Governmental control is not the best solution to the industry's problems.

Italy's Preserved Foods Control

As an experimental measure, the Italian Ministry of Foreign Trade is enforcing qualitative and hygienic controls on a wide range of preserves, with effect from July 1. The products affected include fruit, and vegetables preserved in vinegar, spice, or mustard; canned fruit; candied peel, jams, and jellies; fruit pulp and paste; fruit and vegetable juices, excluding grape juice; sauces and seasonings; and canned and powdered soup.

The measure has been prompted by complaints received from Italian export markets. It is reported in trade circles that 170,000 cases of cans of tomato juice have been rejected by the U.S. because they did not conform to the hygienic standards required by American legislation.

Improved Packs for Yeasts

Realising that the dry yeast packaged separately but included with the mix for yeast-raised rolls was the limiting factor in the shelf life of the product, Pillsbury Mills of Minneapolis conducted experiments with packaging materials which showed that the chief factors causing yeast deterioration were heat and, to a lesser degree, humidity.

During this research work, methods for detecting high oxygen contents and de-lamination of films were perfected, and a special device for rapidly detecting leaking envelopes was developed. Tests showed the high temperature effect to be considerably offset by eliminating oxygen. At a temperature range of 80° to 100° F., the shelf life of the yeast was two and a half to three times that of yeast with oxygen in laminated glassine envelopes. Exhaustive research led to a change-over from air-packed to nitrogen-packed yeast, giving a fresher, better hot roll mix.

The pack which has now been developed is unique in function but simple in design. Made from Pliofilm-foil combination, it measures about 3 in. by 8½ in., and contains ¼ oz. of dry yeast.

Optical Parts

To save customers' time in important developmental work by eliminating much of the correspondence previously required for highly precise optical parts, Bausch and Lomb Optical Co. have published a catalogue which gives full details of lenses, prisms, reflectors, and similar items manufactured by them.

It is felt that if engineers and designers can consult this catalogue in the initial stages of instrument development, they can often incorporate standard optical parts into their design and avoid the higher cost of "tailor-made" optics.

New Soya Bean for India

Two new types of soya bean, which can be cultivated in South India, including the plains, where their growth has hitherto not been regarded as possible, have been evolved at the Indian Institute of Science, Bangalore.

Unlike most of the existing kinds, the new bean is essentially the culinary type grown in the same way as other beans and peas. It has high food value and is stated to be specially suited for diabetic patients.

Sufficient seed of the new bean has been raised at the Institute for distribution to research stations in the State.

Efforts to Gain U.S. Market

Many European food manufacturers, who exhibited their products at the recent International Food Exposition in Chicago, have changed their methods of packaging and merchandising to attract the American consumer.

Market investigators had discovered that a multiplicity of sardine brands confused the American consumer, and the American preference for small sardines had brought about a change in canning.

According to a New York firm of importers, the American appetite for European specialities is a product of growing cosmopolitanism, and such broadened tastes have greatly widened the market in the U.S.

The Vianda Ham and Meat Product Packers of Leiden, Holland, report that a brighter label lithographed on tins has brought an encouraging response. A product of theirs which attracted attention was a 250 g. tin containing an assortment of luncheon meat—smoked beef, Canadian-style bacon, ham, cervelat, and salami—all sliced and ready for consumption.

Denmark's Hafnia hams were on display in an increased variety of tin sizes. Notable new products were milk cheese spread needing no refrigeration, and concentrate of blackcurrant syrup for beverages.

Harpoon Gunner Shot 446 Whales

Returned to Tönsberg, South Norway, after spending the winter on the Antarctic whaling grounds, is Arne Skontorp, this season's most successful harpoon gunner. From December to March he shot altogether 446 whales, estimated to produce 27,000 barrels of whale oil, equivalent to about 4,500 tons, and worth at least £450,000.

News from the Ministries

Appointments

Mr. A. R. Manktelow, C.B., Under Secretary, has been appointed Principal Finance Officer by the Minister of Agriculture and Fisheries.

Mr. J. B. Baber, C.B.E., M.C., T.D., has been promoted to the rank of Under Secretary.

Mr. J. A. Payne, O.B.E., formerly Principal Private Secretary to the Minister, has been promoted to the rank of Assistant Secretary.

The Minister has appointed Miss J. M. Elworthy to be his Principal Private Secretary.

*

Mr. N. R. Beattie, M.D., D.P.H., has been appointed a member of the Food Standards Committee in place of Mr. E. L. Sturdee, O.B.E., M.R.C.S., L.R.C.P., who has resigned.

Declaration of Specified Areas

On February 20 the Minister of Food declared his intention, subject to consideration of such representations as might be made, of laying before Parliament Orders to come into force on October 1, 1951, specifying the London and Portsmouth areas under the Food and Drugs (Milk, Dairies, and Artificial Cream) Act, 1950. The Minister has considered representations made within the period allowed and the Milk (Special Designations) (Specified Areas) Order, 1951, specifying the two areas has been laid before Parliament.

The effect of this new Order will be that from October 1, 1951, all milk sold by retail within the London and Portsmouth areas must be special designated milk, *i.e.* sterilised milk, pasteurised milk, tuberculin tested milk, or accredited milk from a single herd.

Bakers' and Confectioners' Charges

The present controlled maximum prices of flour confectionery have been reviewed by the Minister of Food in the light of the higher costs of production, and it has been decided to allow the following increases:

(*a*) An increase of 6d. (from 3s. to 3s. 6d.) a pound net in the maximum price of flour confectionery, where the combined content of fat, sugar, and dry egg solids (or any two of them) amounts to 45 per cent. or more of the total weight, or where for every pound of cake the ingredients cost 1s. or more.

(*b*) An increase of 7d. (from 1s. to 1s. 7d.) a pound net in the maximum price of uncooked pastry.

(*c*) An increase of 3d. (from 1s. 9d. to 2s.) a pound net in the maximum price of all other flour confectionery.

In addition, a new maximum price of 6s. a pound net has been prescribed for flour confectionery containing less than 15 per cent. by weight of flour or other farinaceous ingredients. This will enable bakers and confectioners to make the lighter varieties of flour confectionery, such as éclairs and macaroons, and the more elaborate types of celebration cake.

It has also been decided to discontinue the licensing of manufacturers of flour confectionery.

The present ban on charges for delivering bread has been removed. In consequence, the present special price for bread delivered in those sparsely populated areas which are specified in the Bread Order cease to apply, but the higher prices prescribed for bread sold in Northern Ireland, the Highlands and Islands of Scotland, and the Holy Island of Northumberland will still remain in force.

It has also been decided to prescribe one weight of 5 oz. for Baps in Northern Ireland in place of the existing weights of 7 oz. and 8½ oz.

These changes took effect from June 24, 1951. The necessary Orders will be made as soon as possible.

Control of Meat Products

The Meat Products and Canned Meat (Control and Maximum Prices) Order, 1948, has been further amended as from June 14, 1951. The principal effects of the new Order are:

1. To free meat paste from price control.
2. To permit whalemeat to be mixed with other meats provided the product is labelled and sold as a whalemeat product.
3. To make clear that the only type of milk powder to be used in sausages is skim milk powder.

The Order also cancels the provisions governing the meat content of meat pastes and the fish content of fish pastes, but temporary Standard Orders will maintain similar provisions until the Food Standards Committee has completed its review of the two foods.

The Flour Order, 1951

The Flour Order, 1951, which consolidates, with amendments, the Flour Order, 1947, has been made. The principal changes in the new Order, which came into force on June 17, 1951, are:

1. The maximum retail prices for some of the smaller sized bags of prepacked flour are increased.
2. The prices of wheat by-products sold to food manufacturers are increased.
3. The deposit charges on returnable sacks and bags and the charges for non-returnable bags are increased.
4. Licences to prepack flour are no longer needed.
5. The prescribed price of semolina on sales by flour millers, licensed factors, and importers (other than sales by retail) is increased.
6. The maximum retail prices of semolina (except when sold prepacked in ½ lb. containers) are increased.

Toxic Chemicals Enquiry Extended

The Working Party on precautionary measures against toxic chemicals used in agriculture, whose first report was published in April, 1951, has been asked by the Ministers concerned to enquire whether any risks arise, from the point of view of the consumer of the final product, in the use of toxic chemicals in agriculture and in the storage of food, and to make recommendations for protective measures should these appear to be desirable.

Organisations wishing to submit written evidence to the Working Party should write to Mr. W. K. Melrose, Ministry of Food, Portman Court, London, W.1.

Bread Subsidy

The rate of bread subsidy payable to bakers in England and Wales will be 10s. per sack from March 25 to 31, 1951, 15s. 9d. per sack from April 1 to 7, and 7s. 0½d. per sack from April 8 until further notice.

Bread subsidy claim form BS.77 for the eight-week period May 20 to July 14, 1951, provides for the adjustment in subsidy payments made during the period March 25 to May 19 when provisional rates were operating pending agreement on the rates of subsidy to apply from March 25.

Export Licensing Regulations

The Export of Goods (Control) Order, 1951, which came into operation on June 21, 1951, brings up to date the Consolidation Order, 1950, with all subsequent amendments.

In addition one formal change is made: goods for which a licence to export has already been given under the recent Control of Goods (Import Certificates) Order, 1951, are no longer controlled under this Export of Goods Order.

Insect and Rodent Control

The Prevention of Damage by Pests (Application to Shipping) Order, 1951 (S.I. 1951, No. 967), made on May 31, 1951, contains provisions for the control of rats, mice, insects, and mites in ships. The Order does not disturb the procedure for the control of rats and mice in foreign-going ships, but local authorities are required to ensure that other vessels in their districts are kept free from rodents. The control of insects and mice will be dealt with by the Ministry of Agriculture and Fisheries and the Department of Agriculture for Scotland. A Memorandum of Arrangements setting out the procedure to be followed by masters of seagoing ships is in preparation. The Order comes into force on October 1, 1951.

Condensed Milk for Ships' Stores

By arrangement with the Ministry of Transport, full cream unsweetened condensed milk (evaporated milk) issued for ships' stores since July 1, 1951, has contained a minimum fat content of 10 per cent. as was the practice before the war.

The following maximum selling prices for this milk are prescribed in the Condensed Milk Order, 1951, which came into force on July 1, 1951:

	Per Case of 48 Cans
On a sale by the Condensed Milk Pool, Ltd.	44s. 3d.
On a sale by wholesale (other than a sale by the Pool to a wholesaler)	46s. 6d.

This milk is not available for sale to the general public.

Import Licensing Arrangements

Arrangements for the import under licence of a large number of fresh fruits and vegetables from various countries were announced by the Board of Trade on December 12 last. The Board now announce the extension of this scheme to imports of garlic and of avocado pears from Argentina, and of strawberries from Yugoslavia.

Importers already holding a licence under this scheme will receive an amendment to their licence showing these additions; no action on their part is called for.

Importers not holding such a licence and who wish to share in these arrangements should apply on form ILB/A (Revised), obtainable from the Import Licensing Branch of the Board of Trade, Romney House, Tufton Street, S.W.1. For administrative convenience their application should be returned through the Ministry of Food's Fresh Fruit and Vegetables Division, Import Section, 24/32, York Terrace, Regent's Park, S.W.1.

Restricted Use of Cellulose Film

It has been agreed between the Board of Trade and manufacturers of transparent cellulose film that as from June 25, 1951, cellulose film may no longer be supplied for a number of less essential uses in the home market. Firms using film for these purposes will, however, be permitted to use up any stocks which may be in their possession.

As the output of cellulose film is now restricted by the sulphur shortage, it is necessary to conserve most of the supply for direct export and for the wrapping of other goods for sale in the export market, particularly in cases where hard currency may be earned by these means.

Uruguayan Negotiations

A contract supplementing the Anglo/Uruguayan Ninth Bulk Meat Contract of December, 1949, was signed recently in Montevideo.

Under this contract, the Uruguayan Government undertakes to sell to the United Kingdom not less than 20,000 tons of carcass meat and offals and 3,000 tons of canned meat during the 12 months ending April 22, 1952, at prices similar to those recently agreed between the United Kingdom and Argentina. The United Kingdom Government has undertaken to buy any additional supplies that may be offered during this period.

The contract also provides for the resumption of shipments of chilled beef on the same terms and conditions as those agreed with Argentina.

The United Kingdom Government has agreed to pay the Uruguayan Government £1½ million as a total and final adjustment of prices for meat shipped from the beginning of the 1949 contract until the end of 1950.

Arrangements have been made for talks to take place, not later than February 28, 1952, on prices and other arrangements for continuing meat shipments after April 22, 1952.

Import of Strategic Goods

In future an exporter in another country may, in cases where his own Government require to be satisfied that strategic goods ordered by an importer in the United Kingdom will in fact be imported into the United Kingdom, ask his customer to produce an import certificate.

Any importer who receives such a request should apply to the Board of Trade Import Licensing Branch, Romney House, Tufton Street, London, S.W.1.

If an import certificate is issued to him, the importer will be bound by the provisions of the Control of Goods (Import Certificates) Order, 1951, and will be liable to penalties if the goods are diverted to any other destination without the approval of the Board of Trade.

Information and Advice

Chocolate Butter Cream

B.5195. *Can you supply us with a recipe for chocolate butter cream for covering and decorating cakes?* (Australia.)

Chocolate butter cream is often prepared from ordinary butter cream with the addition of chocolate colour and flavour, but for a superior product the following is suggested as a basis for trial:

White sugar	3 lb.
Glucose	1½ lb.
Water	¾ pint
Unsalted butter	4½ lb.
Eggs	6
Melted chocolate	1½ lb.
Chocolate colour	*q.s.*
Vanilla essence	*q.s.*

The sugar, glucose, and water are measured into a copper pan and the solution is boiled up quickly to 240° F., taking the usual precautions to prevent graining of the sugar.

The eggs should be beaten up in the machine bowl; the sugar solution is then slowly poured over the eggs and whisking is continued until it is nearly cold and light.

The whisk should then be removed from the machine and the butter beater put on. The butter is gradually added to the mixture and the whole is well beaten up to a light, velvety cream. Some drops of vanilla essence and the melted chocolate are added to colour and flavour the cream. The cream is then ready for use as desired.

This butter cream will set firm and mellow when cold. It should be heated if this happens, and mixed to keep it soft and at a working consistency.

Dessert Figs

B.5200. *We shall be glad to receive any suggestions for the use of dried figs.* (Ireland.)

We suggest that dessert figs might be made and the following recipe could be tried out:

First Batch		*Second Batch*	
	lb.		*lb.*
White sugar ...	56	White sugar ...	7
Corn syrup ...	14	Raw sugar ...	7
Agar-agar ...	2	Apple pulp ...	7
		Fig pulp	25

The agar is soaked in an ample volume of cold water overnight.

Before commencing manufacture, about 112 lb. or more of dried figs are placed in a steam pan, the amount depending upon the number and capacity of the steam pans available. The figs are covered with water and boiled until quite soft and pulpy. One hundred and twelve pounds of dried figs should yield 168 lb. of fig pulp, therefore the water used is regulated to achieve this bulk.

The boiled figs are passed through a fruit pulping machine to obtain a uniform pulp free from stalks, straw, and other foreign matter. The fig pulp is then available for use in the process as required.

Fifty-six pounds of sugar and 14 lb. of corn syrup, with water to cover, are placed in a steam pan, the steam is turned on, and the batch is stirred to dissolve the sugar thoroughly. The strained agar is added, stirred to dissolve, and the batch cooked to a good sheet on the spatula. It is allowed to cool somewhat, and skimmed of any surplus scum.

In another steam pan, the 7 lb. of white sugar, 7 lb. of raw sugar, 25 lb. of fig pulp, and 7 lb. of apple pulp are cooked to 226° F., *i.e.* to a stiff jam.

The second batch is added to the first and mixed thoroughly without unnecessary agitation. The combined batch is transferred into the depositor of the Mogul and deposited in impressions, appropriately shaped, in dry warm starch.

Starch is sifted over tops of trays to assist case hardening. The filled trays are stacked in a warm dry room until set.

When thoroughly set, the goods are passed through the Mogul machine, dry steamed lightly, rolled in caster sugar, and set out in trays to dry.

It is important to ensure that the second batch is a stiff jam, otherwise the final product will incline to weep, owing to the presence of excess moisture.

Sweet Pickles

B.5231. *Can you let us know how to keep a check on sugar and acidity during the manufacture of sweet pickles?* (Middlesex.)

It may be necessary to examine the sauce and syruped vegetables separately. If all the acid is added by way of the sauce, it will be necessary first to fix on the quantity of vegetable and sauce and from this to calculate the acidity required in the sauce to take care of the finished product. Each batch of sauce should then be tested for acidity. So also should each batch of finished pickle, because the fact that the sauce acidity is correct to begin with together with a correct acidity in the finished pickle is at once a check on the proportions of vegetable and sauce. Sugar determinations in sweet pickles may or may not be carried out on each batch. When the continuous syruping process is used and carefully controlled, the sugar content of the syruped vegetables is usually constant.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.5192. *Potato crisps.* (Australia.)
B.5193. *Bacon smoking.* (Warwicks.)
B.5201. *Sweetened fat.* (Ireland.)
B.5203. *Floor finishes for factories.* (Warwicks.)
B.5204. *Preservative powder for the icing of fish.* (Lincs.)
B.5208. *Colouring for marmalade.* (Northants.)
B.5209. *Silicones for the baking industry.* (Lincs.)
B.5212. *Fish canning.* (Yorks.)
B.5213. *Gas storage of eggs.* (Ireland.)
B.5215. *Pumps.* (Hants.)
B.5216. *Egg noodles.* (Ireland.)
B.5217. *Mushroom growing.* (S. Africa.)
B.5219. *Blackcurrant juice.* (Suffolk.)
B.5220. *Lollipops and rock.* (Ireland.)
B.5221. *Poultry plucking.* (Dorset.)
B.5222. *Bin discharger and labelling.* (New Zealand.)
B.5223. *Twin cylinder driers.* (Belgium.)
B.5224. *Ice cream stabilisers.* (Belgium.)
B.5225. *Wheat gluten.* (Sweden.)
B.5229. *Desiccated coconut and fruit dehydration.* (China.)
B.5232. *Rhubarb preservation.* (Scotland.)
B.5233. *Vacuum driers.* (Ireland.)
B.5238. *Edible oil.* (London.)
B.5239. *Laboratory glassware.* (Lancs.)
B.5242. *Processed peas, Worcester sauce, and synthetic cream.* (S. Australia.)
B.5243. *Rice processing plant.* (Ceylon.)

Recent Patents

654,457. A.S.P. Chemical Co., Ltd., Walsh, C. L., and Adams, B. A.: Process for the extraction of pectic substances from vegetable matter.
654,458. Rigid Containers, Ltd., and Burditt, H.: Boxes made of cardboard or similar materials.
654,468. Continental Can Co., Inc.: Treatment of food products in sealed containers.
654,525. Creamery Package Manufacturing Co., Ltd., and Clark, R. T.: Plate heat exchangers.
654,597. Frechin, R. E. A. J.: Production of gelatine.
654,629. Burgess, A. F. (International Minerals and Chemical Corporation): Manufacture of glutamic acid.
654,665. Belsinger, Inc.: Boxes or containers.
654,722. Bovril, Ltd., Booth, R. G., and Keeley, E. C.: Preparation of dried milk powder and milk beverages.
654,748. Leigh, M.: Apparatus for wrapping ice cream blocks and other articles of rectangular form.
654,760. International Minerals and Chemical Corporation: Processes of preparing glutamic acid and salts thereof.
654,767. Aktieselskabet de Danske Sukkerfabrikker: Production of jellifying pectins.
654,798. Waddington, Ltd., J., and Bradley, H.: Cartons and like containers.
654,820. Stevens, A. H. (Firestone Tyre and Rubber Co.): Containers for liquids, particularly milk.
654,826. Gaskell and Chambers, Ltd., and Ironside, J. G. S.: Apparatus for dispensing beverages.
655,049. Aktieselskabet S. A. Christensen and Co.: Non-return valves for milking machine covers.

Abstract of a Recent Specification

Closing and Sealing Paper Bags

This invention relates to new and useful improvements in machines for automatically closing and sealing the mouths of filled paper bags and particularly seeks to provide novel mechanisms for forming the double-fold closures of slack filled bags.

In the packaging of certain bulk materials, such as sugar and the like, a definite desire has been evidenced by many of the packaging companies to utilise slack filled bags in order to avoid any tendency of the bag contents to cake or harden as they would do over a period of time if they were packed tightly.

Normally such commodities are packaged in paper bags, loosely filled, and sealed through the use of the common or double-fold closure. However, prior known mechanisms for forming the double-fold closure proved to be unsatisfactory since the closures formed thereby were either loosely folded or were not uniform.

This invention overcomes the difficulties heretofore met in the mechanical formation of uniform, tightly folded closures of the double-fold type for paper bags and the like.

639,582. *Consolidated Packaging Machinery Corporation.*

Recent patents have been selected from the "Official Journal of Patents" and are published by permission of the Controller of H.M.S.O.

Trade Marks

LARONA.—673,760. Coffee, tea, cocoa, flour, preparations made from cereals for human consumption, biscuits (other than biscuits for animals), baking powder, and flour confectionery. **Gilles Jacob van Mesdag** and **Jacob Siegfried van Mesdag,** trading as **C. J. van Houten and Zoon,** 47, Amsterdamscheweg, Weesp, Holland; Manufacturers and Merchants.

RED FEATHER.—683,200. Cheese, preparations consisting principally of cheese for food, sandwich spread of which pickled gherkin is the predominating ingredient, mayonnaise, salad cream, salad dressing (in the nature of mayonnaise), condensed milk, powdered milk, tinned baked beans, and meat pastes. **Kraft Walker Cheese Company Proprietary, Limited** (a Company incorporated under the laws of the State of Victoria, Commonwealth of Australia), Riverside Avenue, South Melbourne, S.C.4, State of Victoria, Commonwealth of Australia; Manufacturers.

BALDWIN'S.—685,581. Tinned fruits and tinned vegetables. **Worcestershire Packers and Growers, Limited,** Cannery and Packing House, Tenbury Wells, Worcestershire; Packers and Growers.

LAUNERS SUPA LOAF.—685,592. Bread. **Launers, Limited,** 61, Weedington Road, Kentish Town, London, N.W.5; Manufacturers and Merchants.

SILVER-VALLEY.—690,569. Canned meat, canned fish, canned vegetables, canned soups, canned fruits, preserved fruits, pickles, and piccalilli. **Maurice Lee Unger, Limited,** Garden Canneries, Garden Lane, Boothstown, Lancashire, and 117, Water Street, Manchester, 3; Food Canners.

SUNRIPE.—690,825. Jams. **Nelson Preserving Company, Limited,** Nelson Factory, Long Lane, Aintree, Liverpool, 9; Manufacturers.

KRAFT.—691,377. Mayonnaise, horseradish cream, and sandwich spread made principally from gherkins. **Kraft Cheese Company, Limited,** Silverdale Road, Hayes, Middlesex; Manufacturers and Merchants.

CAMPBELL'S.—692,366. Canned tomato juice for use as a beverage. **Campbell Soup Company, Limited** (a Corporation organised under the laws of the Dominion of Canada), Third and Birmingham Streets, New Toronto, Ontario, Dominion of Canada; Manufacturers.

BEXTRA.—694,208. Icing sugar. **James Budgett and Son, Limited,** 2, 3, and 4, Idol Lane, London, E.C.3; Merchants.

DOUBLE DIAMOND.—694,983. Canned meat. **European and Overseas Food Produce Company, Limited,** 33, Cock Lane, West Smithfield, London, E.C.1; Food Importers and Exporters.

QUAKER KRUNCHIES.—695,305. Cereals and preparations made therefrom, all for food for human consumption. **Quaker Oats, Limited,** Bridge Road, Southall, Middlesex; Manufacturers and Merchants.

CAROVITA.—695,418. Pig and poultry compound foods. **G. C. Dobell and Company, Limited,** 9, Rumford Street, Liverpool; Manufacturers.

IRIS.—695,494. Eating chocolate and non-medicated chocolate confectionery. **Helm Chocolate, Limited,** Bridge Mills, London Road, Wallington, Surrey.

Trade marks have been selected from the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

New Companies

English Orchard Company (London), Limited. (492614.) 83/85, Evelina Road, Nunhead, S.E.15. To carry on business of manufacturers, preservers, and canners of and dealers in jams, preserves, syrups, honeys, etc. Nom. cap.: £10,000 in £1 shares. Dirs.: S. Lewis, 85, Evelina Road, S.E.15; E. J. Lovesee, 41d, Lewis Buildings, Warner Street, S.E.5; R. F. Thoden, Malpas Road, Brockley, S.E.

Watts and Drury, Limited. (492862.) 74, Crown Street, Peterborough. To carry on business of buyers, sellers, dealers, collectors, and packers of eggs, etc. Nom. cap.: £15,000 in £1 shares (5,000 cum. pref.). Permt. dirs.: Alice Watts and F. M. Watts, 140, Lincoln Road, Werrington, Peterborough; Mary Drury, address not stated.

H. and D. Caines, Limited. (492897.) To carry on business of farmers, milk producers, and dairymen, etc. Nom. cap.: £2,000 in £1 shares. Permt. dirs.: H. Caines, Chalbury Farm, Horton, Wimborne; D. Caines, Greenlea Holt, Wimborne.

Sleepy Hollow Piggeries, Limited. (492924.) Sleepy Hollow, Chiddingfold, Surrey. Nom. cap.: £1,000 in £1 shares. Permt. dirs.: F. Nash, 18, Granville Place, W.1; W. Moser, Sleepy Hollow, Chiddingfold, Surrey.

Mosleys Crisps, Limited. (492957.) The Canteen, Ingrow Lane, Keighley. To carry on business of potato crisp manufacturers and dealers, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: C. C. Mosley and Florence M. Mosley, 1, Westfield Drive, Riddlesden, Keighley.

Turners (Cudworth), Limited. (492971.) 254, Barnsley Road, Cudworth, nr. Barnsley, Yorks. To carry on business of bakers, pastrycooks, and flour millers, etc. Nom. cap.: £2,000 in £1 shares. Permt. dirs.: F. Turner (permt. mang. dir.) and Mrs. N. Turner, 254, Barnsley Road, Cudworth, nr. Barnsley, Yorks; G. Turner and Mrs. D. M. Turner, 147, Barnsley Road, Cudworth.

J. Edwards (Mevagissey), Limited. (494797.) West Quay, Mevagissey, Cornwall. To carry on business of fish merchants, etc. Nom. cap.: £5,000 in £1 shares. Dirs.: J. Edwards, Miss J. Edwards, and Miss M. E. Edwards, all of Southcliffe, Polkirt, Mevagissey; A. S. Edwards and Mrs. H. Edwards, 6, Mount Prospect Terrace, Mevagissey.

Deli-Cream (Bournemouth), Limited. (494836.) 3, Hannington Place, Boscombe, Bournemouth. To take over business of ice cream manufacturers and confectioners carried on as "Deli-Cream Dairy Ice Cream" at Scotter Road, Pokesdown, Bournemouth. Nom. cap.: £1,000 in £1 shares. Permt. dirs.: F. G. Williams and Mrs. L. Williams, 28, Seafield Road, Southbourne, Bournemouth.

A. V. Pugh and Company, Limited. (494866.) 353, High Street, West Bromwich. To take over business of retail butchers and manufacturers of preserved meats, carried on as "A. V. Pugh and Co." at West Bromwich. Nom. cap.: £5,000 in £1 shares (4,000 red. pref.). Dirs.: A. V. Pugh and Hilda Pugh, 353, High Street, West Bromwich; F. L. Wilson and Mabel V. Wilson, Beaufort, Victoria Road, Oldbury.

Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C.2.